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A Lecture

ON THE DIAGNOSIS AND TREATMENT OF CEREBRAL SYPHILIS.

A Post-Graduate Lecture for the Fellowship of Medicine, delivered at the Royal Society of Medicine

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This subject was chosen for discussion because, first, in the evolution of cerebral syphilis, widely different clinical pictures may be presented, giving rise to many difficulties in diagnosis, and, secondly, the disease can frequently be eradicated without leaving serious permanent disabilities if treatment is begun at an early stage and is sufficiently persistent. In cerebral syphilis the *Spirochæta pallida* has attacked mainly the meninges and blood-vessels. The neural tissues, however, rarely escape either direct invasion by the organism or local necrosis secondary to interference with blood supply; but encephalitis is superficial as compared with the deep and extensive process in dementia paralytica; hence the difference of the response to treatment. The pathological process may be limited throughout the course of the complaint to the intracranial contents, but usually the spinal cord, its roots or meninges are sooner or later also attacked.

HISTORY OF INFECTION AND DEVELOPMENT OF THE DISORDER.

When dealing with nervous disorders it is a commonplace to mention the importance of inquiry as a routine into the patient's previous history in regard to venereal infections. In men the history of chancre with or without a subsequent rash or sore-throat is obtained in a large proportion of cases of cerebral syphilis. Sometimes gonorrhœa but not syphilis is admitted, and later the Wassermann reaction is found to be positive. This important fact should be remembered, for there is no doubt but that an unobtrusive chancre may run its course unnoticed when the local reaction to gonococcal invasion is severe. In women this part of the investigation is more difficult, for it is, of course, as a rule undesirable to ask direct questions on this subject; but even when this is done a negative history of primary or secondary lesions is usually obtained. If the woman is married an inquiry into the results of her pregnancies should never be omitted.

Symptoms of cerebral syphilis may appear within a few months or even weeks of the infection or may be delayed for years. The development of the disorder as revealed by the history of the patient's symptoms is of great diagnostic importance. No symptom of which he may complain is peculiar to cerebral syphilis, nor can the grouping of symptoms and signs at any phase in the malady be made the basis of a confident diagnosis. But when the patient relates a story in which, for example, paroxysmal severe headaches, attacks of giddiness, transient cranial-nerve palsies, or mental deterioration are prominent, and the clinical examination reveals signs of multiple cerebral lesions, there is presumptive evidence of cerebral syphilis. The diagnosis is more certain if he admits syphilitic infection, and is complete if the specific serological tests are found to be positive.

Common characteristics of cerebral syphilis might be categorically stated as follows: (1) Multiplicity of symptoms pointing to organic lesions; (2) their frequent transient nature; (3) the consequent changefulness of the clinical picture presented at different stages in the evolution of the disorder. These features, however, may be said to be equally characteristic of two other diseases of the central nervous system—namely, disseminated sclerosis and encephalitis lethargica. We will deal with their differential diagnosis as occasion arises.

COMMON CLINICAL MANIFESTATIONS IN CEREBRAL SYPHILIS.

It would be unprofitable in a single lecture to attempt to describe fully the symptomatology of cerebral syphilis in relation to diagnosis. Our time will be better spent if we confine our attention to the more common clinical forms of the disorder and to deal with diagnostic difficulties under each symptom-group.

Headache, Vomiting, and Giddiness.

One of the almost constant early symptoms is headache. It is usually severe and may be described as throbbing and stabbing, and, at its height, often stupefying in its intensity. Although paroxysmal, each attack usually lasts for hours and may persist for days on end. The pain may be worst in some region of the head, but it is most commonly general and often associated with tenderness of the scalp as a whole. When the pain is circumscribed—for example, in the frontal, temporal, or occipital region—and is accompanied by a fan-shaped area of cutaneous tenderness spreading upward, it is generally due to involvement of the corresponding cutaneous nerves in a gumma of the skull or its coverings. Between the paroxysms the pain may disappear, but more commonly a dull ache persists. Too much has been made of nocturnal aggravation of the syphilitic headache. During attacks of severe pain the patient is frequently giddy and may vomit repeatedly, and sometimes he is found on examination to have either optic neuritis or papillœdema. The occurrence of these symptoms with or without other clinical manifestations raises the question of cerebral tumour. When cranial-nerve palsies are present without pupillary abnormalities the differential diagnosis between tumour of the basal membranes and syphilitic basilar meningitis often depends entirely on the results of examination of the blood and spinal fluid.

Cranial-Nerve Palsies.

Very few cases of syphilitic meningo-encephalitis run their course without involvement of one or more cranial nerves and, with affection of the basilar membranes, they tend to be attacked early. The palsies that result from these lesions are frequently transient, and throughout the course of an illness signs of damage to several cranial nerves may appear at one time or another and leave little or no permanent disability. Any cranial nerve may be attacked, but some are more commonly injured than others. Disorders of smell are not rare, and limitation of the visual fields on one or other side may be an early sign from invasion of the optic nerves, chiasma, or tracts. Papillœdema when present is usually bilateral, but optic neuritis may occur on one side only. Unilateral deafness is very common and may be associated with weakness of the facial muscles on the same side and pain and tenderness of the skin in the distribution of one or more divisions of the fifth nerve. But pupillary abnormalities, such as a fixed dilated pupil, ptosis, diplopia, or squint from lesions of the third or sixth cranial nerves, are most common of all. The fourth nerve is less often affected. These oculomotor signs may be unilateral or bilateral and are often evanescent.

Of disorders of the pupil the Argyll Robertson phenomenon is the most diagnostic, but in regard to it a word of warning is necessary. First, it is less frequently found in cerebral syphilis than in tabes and dementia paralytica, and its absence should not necessarily be taken as evidence against a diagnosis of syphilitic infection. Secondly, although this sign is most often a manifestation of neurosyphilis it is not pathognomonic of it. It signifies a lesion in a particular part of the mid-brain which, though usually syphilitic, is occasionally due to some other cause. For example, it sometimes occurs with tumour in this region, or with encephalitis lethargica. Thirdly, defective reaction of the pupils to light is as significant as complete absence of response. For example, the movement may be small, sluggish, or delayed and, in spite of continuous stimulation, contraction may be immediately followed by dilatation or to-and-fro movements of the pupil may go on. The diagnostic value of these latter abnormalities is enhanced if they are unilateral. Irregularity in outline or eccentricity of the pupil may also be met with.

Transient cranial-nerve palsies are as common in disseminated sclerosis as in cerebral syphilis, but pupillary changes and severe paroxysmal headaches are very rare in the former, and nystagmus is rare in the latter. When physical signs are present elsewhere they may aid the diagnosis, but many are common to the early stages of both conditions. Manifestations of root lesions, such as local atrophies, or pain and tenderness of radicular distribution, would strongly favour a diagnosis of syphilis. Often differentiation between the two disorders on clinical grounds only is extremely difficult, and must rest on serological tests.

Changes in pupillary reactions are common in encephalitis lethargica, but defective reactions on accommodation or convergence are perhaps most frequently found, although the Argyll Robertson phenomenon sometimes occurs. When in this disorder alterations in the reactions of the pupils are present, they are usually accompanied by lethargy or insomnia, a combination of symptoms which is by no means unknown in cerebral syphilis. Mild pyrexia may also occur in both, so that on clinical grounds only it is sometimes impossible to make a diagnosis. In such circumstances, examination of the blood and spinal fluid is of the greatest value.

MENTAL CHANGES.

Because of the striking nature of the mental alterations in dementia paralytica they have become well recognised. But clinicians are less generally familiar with the psychological abnormalities that are to be found almost constantly in subjects of cerebral lues during some phase or other of their illness, and may be the most prominent feature of the clinical picture presented. This hiatus in general medical knowledge of the disorder may be in part ascribed to the varied character of these mental changes, and also to their close resemblance to some neuroses and psychoses. Thus, in milder cases, the symptoms complained of may at first sight be indistinguishable from those of neurasthenia. The patient is listless, depressed, tearful, worried over trifles, has great difficulty in paying sufficient attention to his business, and in being interested in affairs that used to engross his attention: his memory for recent events is faulty and his diminished efficiency is a source of great worry to him. The resemblance of this disordered mental state to neurasthenia is enhanced by its changefulness in that periods of spontaneous improvement occur.

By careful attention to the nature of certain symptoms, however, points of distinction can often be made out. For example, the neurasthenic headache is more a discomfort than a pain. It is often described as a sensation of weight on the top of the head or of pressure in the temples, or as if a band were constricting the head. On the other hand, the characteristic headache in cerebral lues is severe, prolonged, and prostrating and may be associated with repeated vomiting. Again, the syphilitic looks more ill, is more tremulous, and his fears are less liable to be temporarily dissolved by robust optimism and reassurance. But although these distinctions may excite suspicion, the diagnosis really rests upon the results of careful inquiry into the mode of onset and development of the illness, the question of venereal infection, and examination of the patient for physical signs. If the diagnosis is still in doubt, the reactions of the blood and spinal fluid should be investigated. It should, of course, be remembered that neurasthenic symptoms in a patient who has been infected with syphilis does not necessarily mean that they are manifestations of meningo-encephalitis or arteritis. Although the infection may have been effectively treated at an early stage the patient may doubt the completeness of the cure and dread a recrudescence of the complaint in some terrible form. Under such circumstances a neurosis may readily germinate and develop in a sensitive individual. Suicides from this cause are not unknown. Many syphilophobics have had syphilis, but not all have been cured of their infection, and in every case thorough investigation is an essential preliminary to diagnosis and treatment.

Not uncommonly in cerebral syphilis more severe grades of mental derangement are met with. The neurasthenia-like state we have been considering may be interrupted by a phase of delirium or maniacal excitement, and if the patient is first seen in one of these attacks the diagnosis of the underlying cause may be very difficult. In the delirium there may be complete disorientation with visual hallucinations, but, unlike the hallucinations in delirium tremens, these do not usually take the form of loathsome animals and horrible faces. The absence of evidence of peripheral neuritis and the presence of Argyll Robertson pupils and other suggestive signs aid the diagnosis. An accurate account of the patient's previous health and of his habits would, of course, be of great help, but this is not always easy to obtain from relatives and attendants.

Sometimes periods of excitement alternate with periods of semi-consciousness in which purposive actions, such as ordinary household duties, may be carried out without any memory of them being retained.

An interesting mental disorder in relation to diagnosis is one in which there is an uncontrollable desire to sleep lasting for days, often succeeded by insomnia. When prolonged lethargy of this kind is an early symptom, encephalitis lethargica would naturally be suspected. As already mentioned, diplopia and defective reactions of the pupils, to light or on accommodation or both, are common in this disease and are another source of confusion. Often the diagnosis must rest on serological tests. A lymphocytosis in the cerebro-spinal fluid may be found in encephalitis lethargica as well as in cerebral syphilis, but in the former the Wassermann reaction (W.R.) in both blood and spinal fluid is negative.

Any of the mental disturbances we have so far considered may pass into dementia, and although it is denied by some observers, there is no doubt but that intellectual and emotional impairment may gradually develop as the sole manifestation of disordered mental function in cerebral syphilis. The following excellent example is at present under my care in the London Hospital.

A man of 43 contracted syphilis in 1903 in South Africa. He had held a good position and had average ability. In 1912, while acting as assistant purser on board ship, he had a seizure, after which he was aphasic and paralysed on his right side. He lay in a stuporose state for three or four days, refusing food, and passing urine and fæces under him. Some time later in the same year he was admitted to the London Hospital under the care of Dr. Henry Head; in the hospital records it is stated that he was dull and apathetic and lay curled up in bed, speaking only when he was questioned. He gave sensible answers to simple questions, but his memory even for past events was very poor and his attention feeble. He was completely disorientated in regard to time and was unable to give correctly his age or dates of occurrence of prominent events in his life. He did not suffer from headache, but vomited occasionally and had incontinence of urine and fæces. Careful examination of his nervous system failed to reveal any other abnormalities, except tremulousness of his hands. The W.R. in his blood was strongly positive but negative in his spinal fluid, which contained only two cells per cubic millimetre.

Between May, 1912, and October, 1913, he was given a course of mercurial inunctions and two injections of salvarsan;

he improved considerably, but remained mildly demented, leading an idle existence, apparently without interest in anything. Until recently he has been living on a farm, but unless someone was continually with him to spur him on, he could not direct his attention or stimulate his interest even for a short time to carry out simple duties. He is not at all resistive, but is apathetic and listless and has no desire to do anything. His memory is still very defective, and he is as disorientated as he was before. There is a very slight weakness on voluntary movement of his face and tongue and palate on the right side, and although his pupils react well to light the contraction is not maintained. The W.R. in the blood is still positive, but the spinal fluid is normal.

This case is of interest for several reasons: (1) It is a good example of simple dementia due to meningo-encephalitis; (2) onset after an apoplectiform seizure is not uncommon in such cases; (3) few physical signs are present; (4) the improvement up to a point with antisyphilitic treatment; (5) the non-progressive character of the disability during the last ten years; and (6) absence of changes in the spinal fluid.

I have enlarged upon this case also in order to stress the fact that dementia in a syphilitic subject does not necessarily mean general paralysis of the insane. The distinction is important, for dementia paralytica is invariably fatal within a few years of its onset, and treatment is of little or no avail in arresting its progress. Further, I am convinced that as the result of wrong diagnosis many cases of meningo-encephalitis with dementia are sent to asylums as incurable, and in consequence are not treated. In *dementia* paralytica remissions and relapses occur, but its course is progressive, leading to increasing mental and physical deterioration; the W.R. is probably always positive, not only in the blood but also in the cerebro-spinal fluid, which in addition shows an increased globulin content, lymphocytosis, and the so-called paretic form of colloidal gold curve.

Before leaving the subject of dementia as a manifestation of cerebral syphilis, another diagnostic difficulty must be mentioned. When the disorder appears in adolescence it may easily be confused with dementia præcox. The resemblance is increased if negativism is present, as it may be. But a careful inquiry into the evolution of the illness, together with a search for signs pointing to focal cerebral lesions and investigation of the reactions of the blood and spinal fluid, will clear the diagnosis.

Hemiplegia.

It is, I am sure, unnecessary to remind you that hemiplegia, occurring in a patient under middle age who is not a subject of cardiac disease, is very frequently due to cerebral syphilis. Strictly speaking, it is perhaps most frequently a manifestation not of meningo-encephalitis but of arterial disease, and although the W.R. is positive in the blood it is commonly negative in the cerebro-spinal fluid. When, however, it is accompanied by changes in the pupils, cranial-nerve palsies, or evidence of spinal-root lesions the spinal fluid usually shows specific alterations.

Epilepsy.

Jacksonian attacks are well-recognised symptoms of meningo-encephalitis of the convexity of the brain, and I need not do more than mention them in passing. But I wish to draw attention to the undoubted occurrence in cerebral syphilis of recurring seizures, often indistinguishable from those of idiopathic epilepsy. This clinical form of the disease is not common, but along with cerebral tumour it should be kept in mind when a patient over 20 develops epileptic seizures for the first time. They may be of either the grand mal or petit mal variety and usually recur at fairly long intervals. A feature of them which may help in diagnosis is that the patient is often dazed or stuporose or a longer time after the attack than is usual in diopathic epilepsy. Pupillary abnormalities or other organic signs, when present, would suggest the possibility of syphilis as the underlying cause and the W.R. ought to be examined. It is needless to say, however, that a positive W.R. in an epileptic does not necessarily prove that syphilis is at the base of the complaint; but if physical signs are present and antisyphilitic treatment has a beneficial effect it is practically certain that the syphilitic infection is the cause.

VALUE OF LABORATORY TESTS IN DIAGNOSIS OF CEREBRAL SYPHILIS.

Discussion has recently been renewed in regard to the diagnostic value of the W.R. in syphilitic infections. In relation to diseases met with in this country, with a few known exceptions, it can confidently be said that a definitely positive reaction indicates infection with syphilis, when the test is performed by a competent clinical pathologist. A negative result, however, is not always of the some clear value in diagnosis. For example, in tabes a negative reaction in the blood is by no means uncommon during a quiescent phase; even in the spinal fluid the reaction is sometimes found to be negative.

In cerebral syphilis when the disease is progressive a positive W.R. in the blood can almost always be obtained. In the cerebro-spinal fluid the reaction may be positive or negative. It may be negative when the disease is confined to the cerebral arteries, or sometimes—as in the case of the dementia I have quoted—even when the pathological process is more extensive but the contents of the spinal canal have escaped. A positive W.R. in the spinal fluid is practically always accompanied by lymphocytosis, increased globulin content, and a positive colloidal gold curve.

TREATMENT.

When cerebral lues is diagnosed early, and suitable treatment instituted, good results in a large number of cases can be expected. The disease can frequently be eradicated, and failing this ideal result improvement almost always takes place. But to attain this end treatment by antisyphilitic remedies must be carried out for a long time, and, equally important, it should be judicious. To get the maximum beneficial effect the physician should never lose sight of the patient's general health in his eager attack upon the disease. The drugs used are, in large doses, highly poisonous, and idiosyncrasies to them are not rare.

In severe cases of cerebral syphilis, when the patient is in poor health or when his mental functions are seriously disordered, he should, during treatment, be confined to bed until his condition improves. His diet must be supervised, and when somnolent he may have to be artificially fed.

Insomnia and restlessness or maniacal excitement can best be treated by warm baths and hypnotics, such as paraldehyde or veronal. A useful drug for this purpose is morphine bimeconate in a 2 per cent. aqueous solution. It is given by the mouth in water, an average dose being 25 or 30 minims, repeated in two or three hours if necessary. It has a most soothing effect, especially in cases of nocturnal restlessness. Severe headaches may be the cause of sleeplessness, and when so the treatment of insomnia lies in giving relief from pain. In such circumstances the following powders will be found useful. The basis of them is 5 gr. each of aspirin and pyramidon. If this fails to give relief, one-twelfth or one-sixth grain of heroin hydrochloride should be added. This will usually be successful; but if the patient, although free from pain, is still unable to sleep, the addition of 2½ or 3 gr. of veronal will be sufficient in most cases to give the desired result.

For epileptic seizures sedatives as well as antisyphilitic drugs are necessary. In my experience a combination of bromide and luminal-sodium is best. An average dose is luminal-sodium gr. i., sodii brom. gr. v. with liq. arsenicalis ♏ ii., and inf. gent. co. ½ oz.

twice or thrice daily; but the dose must be suitably adjusted in each individual case. A localised gumma of the meninges on the convexity may have to be removed by operation, if it is giving rise to progressive symptoms of cerebral tumour which antisyphilitic treatment fails to relieve. There is no absolute contra-indication to the use of antisyphilitic remedies, but for old and feeble patients, especially when the kidneys are diseased, small doses should be used and a close watch kept on renal function.

Of the drugs at our disposal arsenobenzol compounds, mercury, and potassium iodide are the most important. Novarsenobillon is the arsenical preparation most used in this country, in doses of 0·15 to 0·9. In my opinion, as a single dose 0·6 g. should rarely be exceeded, and in order to ascertain the patient's tolerance to the drug it is wise to begin with small doses. The drug can be given intravenously, subcutaneously, or intramuscularly. If the subcutaneous or the intramuscular method is employed the drug must be dissolved in aqueous glucose or an oily medium. Sicard, who advocates these methods, uses novarsenobenzol, galyl, or sulpharsenol in small doses—0·15 to 0·2 g., repeated every two days for two months. The injections are said to be almost painless, and excellent results are claimed for this form of treatment.

The method I usually adopt is to give four or six weekly injections of novarsenobillon. This is followed by a course of three or four weeks' duration of mercury either in the form of inunctions or by mouth, together with potassium iodide. An interval of three or more weeks, according to the condition of the patient, is now allowed to elapse before treatment is again begun. The effect of treatment should be gauged at the end of each complete course, not only by the clinical condition of the patient, but also by the reactions of his blood and cerebro-spinal fluid; for it must always be remembered that the disappearance of the patient's symptoms does not necessarily mean that his disease has been cured.

Treatment should be continued periodically, even after improvement in the laboratory tests and in the clinical state has ceased. In general, after two to four complete courses of novarsenobillon, mercury, and potassium iodide, further treatment should be delayed for from 6 to 12 weeks. The necessary precautions during treatment with mercury and potassium iodide and the symptoms of poisoning by these drugs are well known and need not detain us now. But the dangers associated with the administration of arsenic may be mentioned. In the first place, patients with an idiosyncrasy to the drug are now and again met with, hence the advisability of testing as a routine the tolerance to organic arsenic by the administration of an initial minimum dose. When there is an unusual susceptibility to the drug the patient, within a few minutes of the injection, may be seized with malaise, vomiting, and pyrexia, and an erythematous rash may appear. Secondly, sometimes a more intense and even fatal reaction of the nature of anaphylactic shock is met with. On the day after the first or a subsequent injection of novarsenobillon convulsions, pulmonary œdema, and coma may rapidly develop and the patient may die. Thirdly, a few hours after an injection the patient's symptoms may be temporarily increased—the so-called Herxheimer reaction. The appearance of one or other of these reactions is a contra-indication to either further use of arsenic or, if it is continued, the employment of more than minimum doses. Lastly, prolonged and injudicious administration of arsenic will lead to chronic poisoning, of which early symptoms are erythematous eruptions, jaundice, and peripheral neuritis. Arsenic therapy must then be discontinued for at least two or three months.

In closing, let me again insist that either disappearance of symptoms or a stationary clinical state is not by itself a reliable indication of cure of the disease. But in general the syphilitic infection has been eradicated when in addition the specific tests in the blood and spinal fluid have remained negative for five years.

SECONDARY OPERATIONS UPON THE BILIARY SYSTEM.[1]

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The subject allotted to me in this discussion concerns those cases in which a recurrence of symptoms takes place after an operation upon the common bile-duct. About one-fifth of the total number of patients suffering from cholelithiasis upon whom I operate have previously been submitted to operation for this condition. Secondary, tertiary, or multiple operations upon the biliary system may be made necessary by a variety of causes, among which the chief are the nature and condition of this disease, and of its complications and remote effects; and imperfect primary operations.

Factors in Stone Formation.

A study of the nature and condition of the disease must chiefly have regard to the factors bringing about the formation of stone. These factors are dual: infection reaching the bile channels, and an increase in the cholesterol content of the blood. The great majority of the stones which require removal are formed in the gall-bladder; when stones are found in the ducts it is because they, or the small particles from which the larger stones develop, have escaped from the gall-bladder. But there are cases, happily few in number, in which stones are formed in the smaller ducts within the liver, or in the larger ducts which lead to the intestine. An infection may reach the gall-bladder from several directions—from the blood-stream; from the bile flowing downwards from the liver; from the lymphatic plexuses of the appendix, pancreas, liver, &c., which most freely anastomose with that of the gall-bladder; from the common duct, which in turn receives infection from the duodenum; and finally, by contiguity through adhesions to neighbouring organs. Though these are the direct and proximal routes, it is evident that the infection travelling along them is not necessarily a primary infection in the organ from which it is immediately derived. Infection coming from the liver may be primary elsewhere in the body, gain access to the blood-stream, mature in the spleen, and ultimately reach the liver by way of the splenic vein. A search for infective lesions must therefore involve a scrutiny of the whole body, so that the most lurking area of infection may be revealed. A failure to discover such an infection may be responsible for a recurrence of stones in the gall-bladder, the liver, or its ducts.

The cholesterol content of the blood is an important agency in the causation of gall-stones. We have still a good deal to learn with regard to cholesterin, and its presence in the blood in excess in certain conditions. Blood cholesterol determinations have been made for me by Miss Shiskin on a large number of patients suffering from various abdominal disorders, and 100 consecutive cases have been scrutinised for the purpose of this review. In conditions other than cholelithiasis or cholecystitis, low or normal values have been found to be the rule. In uncomplicated cases of cholelithiasis, on the other hand, the cholesterol content of the blood tends to be high. Thus in 40 such cases examined the blood cholesterol values ranged from 0·133 per cent. to 0·409 per cent., the average value being 0·210 per cent. If we take 0·160 per cent. as the average normal figure, with 0·192 per cent. and 0·133 per cent. as the upper and lower normal limits, 60 per cent. of the cases are seen to be hypercholesterolæmic, and, although in the remaining 40 per cent. the cholesterol content of the blood is normal, it is to be noted that in three-quarters of these (that is 30 per cent. of the total) high normal values have been obtained.

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[1] The opening remarks made at a discussion on the Surgery of the Hepatic and Common Bile-ducts at the Royal Society of Medicine on June 27th, 1923.

In all the cases of cholelithiasis examined a marked fall in the cholesterol content of the blood was observed shortly after the operation. This fall is not confined to cases of cholelithiasis. It has been noted by me in diverse other conditions after major surgical procedures, for example, after prostatectomy, gastrectomy, splenectomy, &c. In the cases under discussion the fall is to be attributed sometimes to the direct drainage of the biliary passages, but the effects of the anæsthesia, the slight elevation of temperature sometimes present after an operation, and, indeed, the disturbed metabolism consequent on operation, must all be regarded as contributing factors. Subsequent re-examinations show that after the initial fall there is a rise, in some cases, a progressive one, so that the cholesterol content of the blood may soon reach the pre-operative figure. Such cases belong to the diathetic group; that is to say, they are more or less continuously hypercholesterolæmic, and even after operation for cholelithiasis the hypercholesterolæmia may persist. In the majority of the patients, however, the cholesterol content of the blood had fallen to normal and was found to have remained at the normal level when examined 14 months after the operation.

The treatment of the patient after operation must therefore take into account this condition of hypercholesterolæmia. The following instructions as to diet are given to all patients after operation:—Articles of diet which must be avoided: Yolk of egg, brains, kidneys, sweetbreads, liver, goose and duck, pork and game, fat, stewed and fried meats, cream and cheese, fresh fruit and green vegetables (for three months), butter (only to be taken in small amounts, if at all). A recurrence of symptoms after an operation upon the common bile-duct may also depend upon the following circumstances.

Imperfect Primary Operations.

1. Stones may be overlooked or left behind in any part of the extrahepatic ducts, including the ampulla of Vater. There are times when even a practised surgeon may have his doubts about the presence of a stone in the common duct. In cases when the gall-bladder is thick and shrivelled, and has ceased to perform its functions, the common duct may be found not a little dilated. After the gall-bladder has been removed the same change constantly occurs. What Rutherford Morison calls the "natural cure" of cholelithiasis consists in the closure of the cystic duct and the shrinking of the gall-bladder until it becomes a mere fibrous or calcareous covering for the stones remaining inert within its cavity. The common duct then may be obviously, even grossly, dilated. The question of how best to decide whether such a duct contains a stone is one that surgeons answer differently. The enlargement of glands along the duct and the presence of hard nodules in the head of the pancreas may cause the surgeon to feel almost confident that a stone is present. And in such circumstances the opinion is very generally given that the duct should always be opened and "explored." I disagree most confidently. Exploration of the duct with anything but the finger is a most uncertain method of discovering or locating a stone. A probe or a small scoop will miss a calculus, even one of good size, over and over again, especially if it happens to be in a little pocket aside from the main channel of the duct. Beyond any question the surest method of deciding whether the duct contains a stone is to pass the first and second fingers of the left hand through the foramen of Winslow and the thumb in front of it, and to palpate the duct and compress it between the fingers and thumb, as they travel gently upwards and downwards. To the expert fingers the tiniest fragment of stone can be felt as soon as the duct is empty of bile. The left hand of an assistant, if he too is expert, should carry out an independent investigation. During the last few years I have rarely opened a common duct merely for the purpose of deciding whether it contained a stone. The exploration of a sufficiently dilated duct can be carried out with the left forefinger passed inside it with the extreme probability that with adequate skill and unwearied patience the last fragment of stone will be discovered.

When a stone which lies concealed in the ampulla of Vater has been overlooked at the primary operation, the duodenum *should be opened and McBurney's or* Kocher's operation performed. After either of these operations the drainage of bile into the duodenum is very free and unimpeded. I am very fond of both of these methods. They can be performed with the utmost daintiness and precision, with extremely little risk, and with the confident prospect of a perfect result. The making of a large opening at the lower end of a dilated duct, with, or more often without, the suture of the duct edges to the duodenal wall, will allow stones of even medium size to escape readily into the intestine. I feel sure that these operations are not practised sufficiently often. I am beginning to entertain a belief that they may be the safest of all operations upon the *common* duct, and those in which there is the most confident prospect of complete relief for the future. At least I can claim that their range should be greatly extended. Even when it is not necessary to open the duodenum the dilatation of the lower part of the duct *from above is a most useful* procedure. It may be effected by the passage of probes of the type suggested by Mayo, or by the passage of a rubber catheter through the duct into the duodenum. A later reference will be made to this procedure.

2. Particles of grit may be left in the lower intrahepatic ducts, or in the hepatic or common duct, and inadequate drainage may not give them time to escape. The question of drainage after the operation of choledochotomy is one that still exercises the minds of surgeons, and certain surgeons who ought to know better are practising and advocating the immediate suture of the duct after every operation upon it. In every case of obstruction of the common duct by calculus there is cholangitis, and in a large number of cases there is mud, or dust, or sand, in addition to the larger stones. When there is a large solitary stone of recent descent from the gall-bladder, the closure of the duct may sometimes be safely performed. I have done this a few times in years gone by, always with a feeling of anxiety during the few days following operation, and with no ultimate advantage of any kind to the patient. I make it a rule, and have done for many years, to drain the hepatic duct in all cases of multiple stones. Some of the patients are gravely ill, and in them the method of McArthur of passing a catheter down the duct into the duodenum for the purpose of giving fluid nourishment is invaluable. The catheter acts by the method of "continuous dilatation," which Sir Henry Thompson originated and wisely advocated for the treatment of urethral stricture. Any narrowing of the common duct is, for a time at least, completely overcome, and during that time the smaller stones or the coarse dust and mud of the ducts above are able to escape into the intestine. I give through this tube a 5 to 15 per cent. solution of glucose, with a little carbonate of soda, by the "drip" method, interrupting the steady flow every three or *four hours, to give a meal of peptonised milk*, beaten eggs, &c. As much as 10 to 12 pints of fluid a day may be introduced in this way with great advantage. The tube remains for ten days to a fortnight.

When many stones and much mud have been removed from the common and hepatic ducts, small particles of grit may long continue to descend upon the gauze strips passed up into the ducts to clear them. In such cases I pass Carrel tubes up into as many of the intra-hepatic ducts as I can recognise. These ducts are sometimes so large as easily to contain the finger, and there is no difficulty in passing tubes into them. Around the common-duct incision a barrier of dental rubber is placed. At the end of 24 to 36 hours, when the peritoneal cavity is sealed off, I start the intermittent irrigation by the method of Carrel, washing the ducts out with large quantities of sterile salt solution or plain boiled water. In one such case the nurse counted a few hundred stones and weighed them, and finally weighed the total mass of tiny stones and particles of coarse dust washed down from the liver. She assessed their total number in this way, as "well over a million"! The operation was four years ago, and there has been no recurrence of symptoms, though the operation I performed was the fourth attack made on the common duct. For the first ten days an abundance of fluid was given through a catheter passed into the duodenum. This case raised the question as to the origin of the infection responsible for the formation of the stones. It would appear that in such cases the most likely route of delivery of infective material to the liver is by the splenic vein. In a later case than this, where the spleen was slightly enlarged, I performed the sixth operation upon a patient, drained the blocked hepatic ducts of many thousands of small stones, and then removed the spleen. The washing out of the ducts continued for six months; after that time the bile drained away through the wound, which has closed and broken down again several times since, but stone formation appears definitely to have ceased. I therefore advocate drainage of the hepatic duct in all cases of multiple calculi; drainage with irrigation of the ducts in many of the cases, especially the secondary ones, in which the ducts contain great quantities of mud, the employment of the method of McArthur of catheterism of the lower part of the duct; and in cases in which the lowest part of the duct contains calculi, a more frequent resort to the operation of McBurney. If typhoid organisms are found in the bile the administration of urotropine by the "thump" method is necessary. Thirty grains of acid sodium phosphate in one pint of water are taken during the day, and at night a single dose of urotropine beginning at 30 and increasing to 60 gr. is taken. At the end of a week a respite of a few days is allowed during which alkalies are given. The administration of urotropine again begins and is again interrupted.

3. In cases of primary cholecystectomy failure to divide the cystic duct at the proper place may be responsible for disaster. The variations in the mode of entry of the cystic duct into the common duct and of the variations in the vascular supply of the gall-bladder and ducts have not been sufficiently considered by surgeons in the past; the recent work of E. R. Flint in this connexion may be studied with great advantage. The cystic duct not infrequently runs for an inch or more side by side with the common hepatic duct, to which it is closely bound, until it enters with it into the formation of the common duct. The two may, indeed, not unite until they almost reach the duodenum. If a long piece of the cystic duct is left behind a stone may lie within it and there ncrease, or may quietly migrate from it and escape nto the common duct. On the other hand, too much of the cystic duct may be removed, and with it a piece of the common duct, or of the hepatic duct. The pelvis of the gall-bladder is at times so intimately adherent to the common duct that when the gall-bladder is lifted up to enable the cystic duct to be cleared, the common duct may be stretched, and then o closely resemble the cystic duct that the greatest care is necessary to distinguish them. The inviolable ule in the surgery of the gall-bladder and of the ommon duct is this: "See exactly what you are doing, and until you see do nothing." On four occasions I have removed a part of the common hepatic or common bile-ducts, happily not to a degree prejudicing the recovery of the patient, because mmediate repair of the duct was performed. If this ragedy should occur it should be redeemed at once. The parts are then all in view, and supple, and estoration is not by any means as difficult as it will rove to be in later weeks or months. It is the surgeon who bungles in this fashion who is then the only ufferer. He feels that the operation has not displayed hat degree of ease and mastery in efficient action which stamp the artist; and he has the misery of knowng that he has given less than his best to his patient. If too much of the cystic duct is removed, and with a part of the common duct, a stricture of the latter may result. This stricture may itself be responsible for symptoms which closely resemble those of a floating stone, or be the means of causing that degree of stagnation of bile which leads to infection and makes easier the formation of a stone. A few cases have come my way in which a complete segment of the common duct had been excised, and I have had to reconstruct the duct or to anastomose the hepatic duct to the duodenum.

Improper Operations.

At the primary operation upon a case of cholelithiasis when stones are present both in the gall-bladder and in the common duct, the question as to the best procedure to adopt with reference to the gall-bladder will always arise. At a time when operations were performed with difficulty and attended by grave risk, at a time, too, when relief from symptoms after operations by competent surgeons was less frequent than it is now, it was felt that removal of the gall-bladder was unwise. If mistakes were to be made at all, it was safer to make the mistake of leaving the gall-bladder than the mistake of removing it; the former error could be made good, the latter was almost irreparable. But as the quality of surgery improved, and as by degrees we learnt that recurrence of stones in the common duct was so frequently due to recurrence first taking place in a gall-bladder which had only been drained, and that pancreatitis might arise and often probably did arise by extension from the walls of a diseased gall-bladder, the practice of the removal of the gall-bladder grew more common. A study of its walls showed often that they were filled with organisms, and that the elastic and muscular coats were so thoroughly disorganised, and the mucosa so changed, as to render the viscus incapable of adequately fulfilling its functions either as a reservoir competent to discharge its contents on demand, as a regulator of the rate of discharge of bile, or as an organ secreting a constituent which it was proper for the bile to possess on entry into the intestine or otherwise. The cases in which the gall-bladder is needed for anastomosis with the duodenum at a second operation are now so exceedingly few that this consideration need hardly weigh with the surgeon as he reflects upon the course he is to follow.

The present practice of most surgeons whose experience is large is to remove the gall-bladder at the time the common duct is emptied of its stones.

Involvement of the Pancreas.

There are conditions of the pancreas, its chronic or subacute inflammatory states, that may cause a very close mimicry of the symptoms of calculous obstruction of the common duct. The frequency of the association of disease of the pancreas with cholelithiasis is variously estimated by different observers. The pancreatic changes are not easily measured during an operation. It is difficult to gauge the size of an organ so long and so remote with any approach to accuracy; and qualities of texture in respect of hardness, in one part or another, cannot be expressed in terms that make one surgeon's experience comparable with that of another. Removal of a portion of the pancreas is open to the fallacy that the area chosen may not be equally involved with the rest of the organ. But with all due and necessary allowance for these truths there can be no doubt of the frequency, and the occasional grave severity, of the pancreatic changes. The route by which infection reaches the pancreas is not necessarily the same in all cases. The cause of the cholelithiasis may be the cause of the pancreatitis, or the latter may be the consequence of the former. If the pancreatitis is secondary to cholecystitis the infection may travel from the gall-bladder down the common duct, and along the canal of Wirsung; or it may pass in the lymphatic plexus which is common to the two. Some clinical and all experimental evidence (especially Nordmann's) suggests that invasion by the ducts is the more likely; but there is evidence, too, derived from operations, that lymphangitis may be the chief factor in causing the changes in the pancreas. Whichever may be, in any special case, the correct explanation, it is evidently a safer plan to remove the gall-bladder than to drain it. Cholecystectomy is beginning to displace cholecystenterostomy in the treatment of chronic pancreatitis, as a result, chiefly, of the advocacy and practice of Deaver.

The typical symptoms of calculous obstruction of the duct may occur in the absence of calculus. In operating upon such cases it is a little disconcerting to find a distended common duct in which no stone is present. The head of the pancreas, especially, will be found enlarged and hard and œdematous. The duct lies in such intimate relationship with the gland, that a swelling of the latter compresses the duct, causes stagnation of bile, and consecutively a degree of cholangitis that may be very severe. In such cases the T-shaped tube of Kehr may be used to drain the hepatic duct intermittently, or, as I prefer, two catheters may be introduced, one draining the hepatic duct, the other passing downwards into the duodenum and affording the channel by which abundant nourishment may be given.

Operations on Deeply Jaundiced Patients.

All the operations upon deeply jaundiced patients raise two questions—that of hepatic insufficiency and of its avoidance, if such be possible, by an adequate preliminary preparation of the patient, and that of post-operative hæmorrhage. The symptoms due to the failure of the liver are apt to come quite unexpectedly. The operation has perhaps presented no unusual difficulties, and the patient leaves the operation theatre in good condition. For a few days all goes well; then one of two events attract serious attention. The amount of bile discharged may suddenly diminish or almost cease; jaundice deepens slowly; the pulse becomes slower; the mind is clouded; nourishment is sparsely taken or refused, when it is well taken vomiting begins; the amount of urea in the blood steadily augments, the patient grows rapidly weaker, and dies after a period of coma. In these cases, as Walters has shown, it is renal failure consecutive to hepatic failure that causes death. Or the picture so well described by Walters and Parham may be seen.[2]

"*Clinical Picture of Hepatic Insufficiency.*—Usually the first two to eight days after operation the course is uneventful; biliary drainage and urinary output are normal, fluids are taken well, the pulse and temperature are normal. One of the first signs of the onset of trouble is paling and thinning of the bile with marked increase in the flow. This profuse cholerrhagia does not continue long, but the bile remains thin. The patient begins to grow weaker, the pulse loses volume, and the temperature becomes subnormal. Restlessness and irritability develop with great fatigue and muscular weakness. Soon regurgitant vomiting follows intake of liquids by mouth and little taken by rectum is retained. Jaundice does not deepen markedly, but there is an increasing pallor beneath the icteric blue, the face becomes drawn, and the eyes anxious. The patient grows progressively weaker and finally dies. The urinary output remains proportional to the fluid intake throughout, and the urine reveals little or no evidence of marked nephritis. The blood-urea remains persistently low."

Post-operative hæmorrhage is due to the reduced power of coagulation of the blood, and this probably depends upon a lack of calcium salts. The deficiency of these is made good in two ways, by direct transfusion of blood, or by the intravenous administration of 5 c.cm. of a 10 per cent. solution of calcium chloride on three successive days, as advised by Walters, and by Lee and Vincent. The giving of calcium salts by the mouth even in colloid form has little effect, when, indeed, it has any, upon the calcium content of the blood. The coagulation time of the blood may be brought down to the normal or to the near neighbourhood of the normal by the intravenous administration, and the operation carried out at the appropriate moment. In all these cases it is necessary to administer as much glucose as possible by the mouth and by the rectum, and at the operation to take every care to ligature the smallest vessels. It may sometimes be prudent to postpone the removal of the gall-bladder because of the slow but unceasing weeping of blood from the denuded surface of the liver which sometimes follows upon cholecystectomy.

Secondary operations upon the biliary system are among the most difficult tasks in surgery. To obtain the best results all the highest qualities of the surgeon may be called into play: courage, resource, patience, accuracy and rapidity of judgment, the finest craftsmanship, and a tranquillity of mind and action that nothing can disturb.

STONE IN THE COMMON AND HEPATIC DUCTS.

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THE presence of stones in the common and hepatic ducts is usually significant of the absence of efficient treatment in the particular patient in whom they are found. They denote failure in carrying out the only satisfactory treatment of gall-bladder disease, early cholecystectomy; this would have effectually prevented their entrance into the ducts. This failure is due to errors in diagnosis as well as inefficient treatment. Patients are still too often treated for various types of dyspepsia; that is, symptoms only are treated, and even after the onset of colic we still see attempts made to avoid operation. There is no medical treatment known at present that will remove the cause of the stone formation or dissolve those already formed; all attempts at such must fail and the ultimate death-rate far exceeds that of the curative surgical procedure. The relative number of cases operated upon at the stage when this complication has arisen must vary somewhat in every district according to the skill and bias of its practitioners and the skill and reputation of its surgeons. The percentage in Sir Berkeley Moynihan's private patients as given at Leeds last year was 21·96 (67 out of 305), differs little from mine, 18·5, which includes both hospital and private cases (113 out of 600).

It is obvious from my opening remarks that I do not believe stones form primarily in the ducts except certain rare pigment calculi associated with disease elsewhere. They may, however, increase in size and in number when infection is present and extend in a continuous column from the ampulla of Vater to the liver and even fill the intra-hepatic ducts. It follows, therefore, that if stones are found in the *common duct* after a previous operation for gall-stones, they must have re-formed in the gall-bladder, if this was left, or have been overlooked. This is easy unless they are systematically searched for, and even then they may be missed.

Difficulty of Pre-Operative Diagnosis.

Pre-operative diagnosis is only possible in the presence of typical attacks of colic associated with jaundice, often with rise of temperature. Jaundice is usually present at some time during the progress of the case; thus, in the 113 patients upon whom these remarks are based it had occurred in 78, but only in 33 was it severe and present at the time of operation. Many stones may be present in the common duct without producing jaundice and, on the *other hand*, a transient jaundice may follow an attack of biliary colic and the ducts are found at operation to be clear and the correctness of this confirmed by the subsequent history. In most instances the patient was operated upon for gall-bladder disease and the stones found in the ducts, not by accident but as a result of a definite exploration. Among the 33 cases in whom marked jaundice was present at the time of operation, in 2 it had never been associated with pain; as a distended gall-bladder could be felt the diagnosis of carcinoma of head of pancreas was arrived at. In the majority there was a history of abdominal symptoms extending them, and finally weighed the total mass of tiny stones and particles of coarse dust washed down from the liver. She assessed their total number in this way, as "well over a million"! The operation was four years ago, and there has been no recurrence of symptoms, though the operation I performed was the fourth attack made on the common duct. For the first ten days an abundance of fluid was given through a catheter passed into the duodenum. This case raised the question as to the origin of the infection responsible for the formation of the stones. It would appear that in such cases the most likely route of delivery of infective material to the liver is by the splenic vein. In a later case than this, where the spleen was slightly enlarged, I performed the sixth operation upon a patient, drained the blocked hepatic ducts of many thousands of small stones, and then removed the spleen. The washing out of the ducts continued for six months; after that time the bile drained away through the wound, which has closed and broken down again several times since, but stone formation appears definitely to have ceased. I therefore advocate drainage of the hepatic duct in all cases of multiple calculi; drainage with irrigation of the ducts in many of the cases, especially the secondary ones, in which the ducts contain great quantities of mud, the employment of the method of McArthur of catheterism of the lower part of the duct; and in cases in which the lowest part of the duct contains calculi, a more frequent resort to the operation of McBurney. If typhoid organisms are found in the bile the administration of urotropine by the "thump" method is necessary. Thirty grains of acid sodium phosphate in one pint of water are taken during the day, and at night a single dose of urotropine beginning at 30 and increasing to 60 gr. is taken. At the end of a week a respite of a few days is allowed during which alkalies are given. The administration of urotropine again begins and is again interrupted.

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[2] Surgery, Gyn., and Obst., 1922, xxxv., 605.

[*] A contribution to a discussion on the Surgery of the Hepatic and Common Bile-ducts at the Royal Society of Medicine on June 27th, 1923.

3. In cases of primary cholecystectomy failure to divide the cystic duct at the proper place may be responsible for disaster. The variations in the mode of entry of the cystic duct into the common duct and of the variations in the vascular supply of the gall-bladder and ducts have not been sufficiently considered by surgeons in the past; the recent work of E. R. Flint in this connexion may be studied with great advantage. The cystic duct not infrequently runs for an inch or more side by side with the common hepatic duct, to which it is closely bound, until it enters with it into the formation of the common duct. The two may, indeed, not unite until they almost reach the duodenum. If a long piece of the cystic duct is left behind a stone may lie within it and there increase, or may quietly migrate from it and escape into the common duct. On the other hand, too much of the cystic duct may be removed, and with it a piece of the common duct, or of the hepatic duct. The pelvis of the gall-bladder is at times so intimately adherent to the common duct that when the gall-bladder is lifted up to enable the cystic duct to be cleared, the common duct may be stretched, and then so closely resemble the cystic duct that the greatest care is necessary to distinguish them. The inviolable rule in the surgery of the gall-bladder and of the common duct is this: "See exactly what you are doing, and until you see do nothing." On four occasions I have removed a part of the common hepatic or common bile-ducts, happily not to a degree prejudicing the recovery of the patient, because immediate repair of the duct was performed. If this tragedy should occur it should be redeemed at once. The parts are then all in view, and supple, and restoration is not by any means as difficult as it will prove to be in later weeks or months. It is the surgeon who bungles in this fashion who is then the only sufferer. He feels that the operation has not displayed that degree of ease and mastery in efficient action which stamp the artist; and he has the misery of knowing that he has given less than his best to his patient.

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It is obvious from my opening remarks that I do not believe stones form primarily in the ducts except certain rare pigment calculi associated with disease elsewhere. They may, however, increase in size and in number when infection is present and extend in a continuous column from the ampulla of Vater to the liver and even fill the intra-hepatic ducts. It follows, therefore, that if stones are found in the common duct after a previous operation for gall-stones, they must have re-formed in the gall-bladder, if this was left, or have been overlooked. This is easy unless they are systematically searched for, and even then they may be missed.

Difficulty of Pre-Operative Diagnosis.

Pre-operative diagnosis is only possible in the presence of typical attacks of colic associated with jaundice, often with rise of temperature. Jaundice is usually present at some time during the progress of the case; thus, in the 113 patients upon whom these remarks are based it had occurred in 78, but only in 33 was it severe and present at the time of operation. Many stones may be present in the common duct without producing jaundice and, on the other hand, a transient jaundice may follow an attack of biliary colic and the ducts are found at operation to be clear and the correctness of this confirmed by the subsequent history. In most instances the patient was operated upon for gall-bladder disease and the stones found in the ducts, not by accident but as a result of a definite exploration. Among the 33 cases in whom marked jaundice was present at the time of operation, in 2 it had never been associated with pain; as a distended gall-bladder could be felt the diagnosis of carcinoma of head of pancreas was arrived at. In the majority there was a history of abdominal symptoms extending over many years for which all the recognised forms of medical treatment had been tried.

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[*] A contribution to a discussion on the Surgery of the Hepatic and Common Bile-ducts at the Royal Society of Medicine on June 27th, 1923.

Most of these cases were operated upon between the ages of 45 and 55, the oldest patient was 76, the youngest 23 with a three months' history. Her first symptom was a typical night attack of biliary colic followed by jaundice, and before I saw her she had had six further attacks. I removed five small calculi from her common duct. She is now 30 and has had no recurrence. It is my impression that stone is more often met with in the ducts in women, probably because of the earlier date at which men seek treatment. In my common-duct series there were 22 men. To compare with this I have taken my last 113 consecutive cases of cholecystectomy with stones in gall-bladder only; 41 were men. I do not think it is extravagant to prophesy that operations on the common duct will become rarities within the next generation of surgeons, as the students educated in the modern methods of treatment of abdominal disease go out into the world.

Treatment.

With regard to treatment, this consists in removing the stones and carrying out cholecystectomy to prevent further stone formation. I shall deal first of all with those cases, and they are the most common, in which operation is undertaken for gall-bladder disease but in which the symptoms give no indication of stones in the ducts. A shrunken gall-bladder, a dilated cystic or common duct, may at once point to its probability. In all these, and in those in whom there is a history of jaundice, after removal of the gall-bladder, the common and hepatic ducts should be explored through the stump of the cystic duct, enlarging the opening by cutting downwards if necessary and removing calculi if found. Before suturing the opening a pair of fine forceps should be passed and the ampulla dilated. The incision should be closed with a continuous stitch of hardened 00 gut and a drain left to the site of incision. This is, in my experience, the most frequent type of operation. Drainage of the ducts is imperative when infection is present or if much manipulation has been necessary in removing the stones. If calculi become impacted they do so in the ampulla, but it is rare indeed that any other approach but that mentioned is necessary for their removal. In only two have I been compelled to open the duodenum to remove such a stone, and on one occasion I mobilised the duodenum and removed an impacted calculus. All these terminated successfully. It has been a common teaching that the gall-bladder is shrunken in most cases of stone in common bile-duct; this is usually so in late cases with obstructive jaundice, but in only 44 of my series was there a small gall-bladder; in five of those with jaundice it was reduced to a fibrous cord without lumen. A dilated gall-bladder does not exclude stone in the common duct.

To pass now to the cases where stones can be palpated in the ducts. I still remove these where possible, by cutting into the common duct from the stump of the cystic. To be *certain* that the ducts are clear is impossible. On occasions, after removing with forceps and scoop what I considered were all the calculi, I have been able to syringe several others from the common and hepatic ducts. When faceted calculi or putty-like masses are found in the ducts this should always be done. Dr. W. J. Mayo[1] has told us that in nearly one-third of the deaths which followed operation on the common duct for stone, post-mortem examination revealed stones which had been overlooked. Among my cases that died at varying times after operation were five in which stones that I had overlooked or been unable to remove were found post mortem; that is, in half of those in whom this examination was done. It is instructive that in four of these the operation had been undertaken for obstructive jaundice, and I believe that had I been content with drainage only, leaving thorough search to a second operation, at least two of these lives would have been saved. In two of these the stone which I had felt in the duct could not be discovered. In two stones were removed but small calculi overlooked in the ampulla. In all, stones in the common duct were diagnosed. In only one had the common duct not been explored, a patient of 39. I removed a gall-bladder containing stones, but did not explore the common duct and have a definite note that "no stones were felt." She died of acute dilatation of the stomach the same night. Post-mortem examination revealed a small calculus in the ampulla. Had I passed a probe, as I should do now with such a history, I should have discovered it but not have prevented her death.

To pass on to the treatment of the most serious group of all, those with obstructive jaundice and usually cholangitis. I believe that it is unwise to operate in this stage unless forced so to do. I mean that the patient should be watched for a day or two, except in those cases with rigors, when immediate operation is necessary. While waiting, saline and glucose should be given per rectum. If the jaundice persists, so making operation imperative, it is well to do it in two stages; it is safer and stones are less likely to be overlooked. If the gall-bladder is distended and the cystic duct patent, cholecystotomy should be carried out; if not, temporary drainage of the common duct, with removal of such stones as present. These patients stand prolonged manipulation badly, and in this way I have been able to bring cases to a successful issue that would inevitably have been fatal if I had attempted to deal with everything in one stage. At the second operation cholecystectomy is done and the stones removed, and the ducts thoroughly examined in a way that is unwise in deeply jaundiced, ill patients.

Prognosis.

With regard to prognosis, there were 11 deaths in the 113 patients, 9 of these were among the 33 who were operated on for obstructive jaundice, and in 4 stones were overlooked. In 2 the ducts were filled with colourless fluid, the so-called white bile. Both recovered, and the excretion of bile was established within 36 hours. It is obvious how delay increases the mortality; the longer the period of jaundice the greater is the risk. In none of these cases did death result from hæmorrhage, and I have not, therefore, found it necessary to resort to preoperative treatment by blood transfusion or the administration of calcium. Three died of lung complications, one under the anæsthetic, the remainder from the tenth to the eighteenth day from hepatic insufficiency. The two deaths among the 80 who were operated upon at a time when they were not jaundiced were due, one to acute gastric dilatation, the other to pneumonia. These figures illustrate how the risk depends on the condition of the patient with regard to jaundice and infection; cholecystectomy for stone where these are confined to the gall-bladder has a death-rate of less than 2 per cent.

What is the ultimate outlook in the patients who have had stones removed from their common ducts? The cases in which I carried out cholecystectomy and in which cholecystotomy had been performed are almost equal. In the first group, 57, there has been no recurrence of symptoms sufficiently severe to need operation and only two in which post-operative colic occurred, and in both it was within a few weeks of operation and did not recur. In one, however, a stone was overlooked and found post mortem. In those in whom the gall-bladder was left further operations were necessary in seven for removal of calculi from the common duct and in one for chronic cholecystitis. The original operation was only done by myself in one of these. The number of stones removed from cases in the first group vary, but even after the removal of hundreds—and in one case the amount was 5 oz.—no recurrence has taken place.

In conclusion, I should like to emphasise the fact that this is an entirely unnecessary complication, and that when the correct treatment for disease of the gall-bladder is carried out we shall cease to have to discuss and carry out operations for the removal of duct calculi.

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[1] THE LANCET, June 30th, 1923.

GLANDULAR FEVER AND INFECTIVE MONONUCLEOSIS.*

WITH AN ACCOUNT OF AN EPIDEMIC.

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Glandular fever is an acute, infectious, and contagious disease principally of, but not confined to, childhood, characterised by a rapid and marked enlargement of the cervical glands, and by a less constant and less marked enlargement of the spleen, axillary, inguinal, and other glands. There may be some tenderness of the cervical glands, but they are not acutely painful; abdominal pain is occasionally severe. The fauces are often reddened, and a tonsil may be enlarged, but the presence of exudation is unusual and the changes are characteristically slight compared with the marked glandular enlargement. There is no anæmia in the acute stages. There may be a short preliminary period of malaise, the glands appearing about the third day and reaching a maximum in one to three days. With the swelling of the glands there is pyrexia, which is usually about 103° F., but may reach 105° for a day or two; it rarely exceeds 100° for more than a week. The prominent mass of the glands usually subsides in 5 to 15 days, but may relapse or, if unilateral, may occur on the opposite side. Suppuration is extremely rare, and is probably due to secondary infection. Glands in the neck remain palpable for several weeks, or occasionally for months. After the acute stage there is usually a prolonged period of slight depression of health and anæmia which needs attention. Recovery is finally complete and the mortality is negligible.

The most definite complication is a hæmorrhagic nephritis, usually without other manifestations of renal disturbance. Its frequency in well-developed cases is about 6 per cent. The parotid is not affected. The condition has no relation to mumps, whooping-cough, measles, scarlet fever, or tonsillitis, or to leukæmia, Hodgkin's disease, or tuberculosis, or to infections with pyogenic organisms.

Literature of the Condition.

It was first fully described by Pfeiffer in 1889. In an article which Morley and one of us (H. L. T.) published in 1921 the bibliography up to that date will be found. In the last two years attention has been paid, especially in America, to a condition of acute and transient lymphocytosis which has been described as infective mononucleosis. The lymphocytosis is both relative and absolute, and many of the single counts are indistinguishable from those of the early stages of lymphoid leukæmia. Nearly all these cases have occurred in young adults. A few cases under various titles have been recorded in previous years by Türk, Cabot, Deussing, Hall, Ireland and Ruhrah, and others. Ehrlich had met with it, and a search of the older literature under such titles as "acute lymphatic leukæmia with recovery," or "pseudo-leukæmia" would reveal many examples of it. Successful cures have been claimed to depend on various measures, such as the removal of a carious tooth, the occurrence of the lymphocytosis having been ascribed to this abnormality. Series of cases have recently been published by writers in America: Sprunt and Evans in November, 1920, Bloedorn and Houghton in 1921, and Longcope in 1922.

The highest percentage of lymphocytes which has been recorded in these series is in a case of Longcope's—viz., 95 per cent., with a total count of 23,000 leucocytes—a sufficiently startling occurrence. In the case of Ireland and Ruhrah, published under the title A Case of Lymphatic Leukæmia with Apparent Cure, the percentage of lymphocytes was 97·5, with a total count of 20,000. This number of leucocytes has frequently been exceeded. The highest total count in our own experience is 35,000, and the highest percentage of lymphocytes is 85. The clinical manifestations in these cases are indistinguishable from the description given above of glandular fever, and the question arises of the identity of glandular fever and infective mononucleosis.

In 1921, when Morley and one of us went through the literature, no instance was found of a full blood count of a previous case diagnosed as glandular fever. In the case which was then described the lymphocytes rose to a percentage of 85, with a total count of about 15,000. This was the first demonstration of the presence of lymphocytosis associated with a clinical condition recognised as glandular fever. It was considered that the case was identical with the "infective mononucleosis" of Sprunt and Evans. A clinical condition which can be associated with such changes in the blood cells obviously requires recognition and consideration. It is certain that it is frequently overlooked, and it is probably by no means rare.

The special questions which arise are: (1) Is glandular fever a clinical entity? (2) Are glandular fever and infective mononucleosis identical? (3) The relation of these diseases to acute leukæmia and other conditions. Before discussing these questions an account will be given of an epidemic of glandular fever lately under our observation.

An Epidemic of Glandular Fever.

The outbreak occurred in a school for boys between the ages of 8 and 13 years. The school was managed on the usual lines of the best class of preparatory school. The school of 30 boys returned from the holidays on April 27th, 1921. Among the staff was a master, Mr. G., aged 23 years, whose previous movements have been traced without revealing any contact with cases suggestive of glandular fever. On May 12th his neck became visibly swollen on the left side, and the throat was sore, but there was no exudation. Constitutional symptoms were very slight. The prominent swelling subsided in a few days, but the glands remained palpable for a considerable time. Some swelling of the glands was present several days before the 12th, but the date of onset is uncertain.

Also on the same day a day boy was seen in his own home with scarlet fever; his brother (J. B., Case 13) was kept away from school. In consequence of this case of scarlet fever watch was kept in the school for any occurrence of sore throat. On the 23rd two boys reported sick with swelling of the neck and sore throat. Four more cases occurred in the next four days, the last of the six being on the 27th. The clinical condition of all the boys was similar—viz., marked enlargement of the cervical glands, little tenderness, moderate pyrexia, and slight constitutional disturbances. No rash developed. There was no tonsillitis, but in some instances the fauces were reddened. The outbreak was considered to be glandular fever.

No further cases occurred until June 5th, an interval of 9–14 days. On this and the following day 14 more cases developed. Among these was the brother of the boy with scarlet fever, who had returned to school on May 23rd, 14 days previously. Four more cases occurred subsequently, the last being on June 10th. The total number was 24, but it is probable that all the others were slightly affected. Several of the boys had had whooping-cough, mumps, scarlet fever, and measles. The clinical condition, especially in the first group, exhibited the typical manifestations of glandular fever as described above. The epidemic was mild, and constitutional disturbances were usually slight. In no instance did the temperature reach 103°, and in only three boys did it exceed 102°. There was no instance of rigors, sweats, or cough. A transient erythema localised to one flank developed in one boy who had been leaning for a long time on that side, but otherwise there were no rashes. There was a distinct difference in the severity of the first group and the later cases. Of the first group of six, glandular enlargement may be classified as marked in three (Cases 1 to 3), moderate in two (Cases 4 and 6), and slight in one. Of the second group of 18, as marked in two (Cases 7 and 20 in relapse), moderate in six (Cases 11 to 14, 18, and 23), and slight in 10.

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* A paper read before the Section of Medicine of the Royal Society of Medicine on April 24th, 1923.

Glandular Enlargement.—In all cases this was greatest in the neck. Large visible swellings were present in those classified as marked. In these the main mass was in the usual site, deep to the sterno-mastoid muscle, but other glands in the neck were also enlarged. The prominent swelling was in every case initially unilateral. In these marked cases the swelling usually occurred very rapidly, within 24 hours, and the temperature was at its maximum at the onset. In some instances there were a few preliminary days of malaise. The incidence on the right and left sides was about equal. Pain was slight and often absent, though when large a mass was usually, but not always, somewhat tender on palpation. In the less severe cases the development of the glandular enlargement was more gradual, and was equal on the two sides. Owing to the careful watch which was being kept the cases were recognised very early. In several instances glandular enlargement was very slight at first, and while under observation increased for several days. In these instances the temperature was usually normal, or indeed subnormal, when first recorded and rose with the increase in the size of the glands. The axillary glands were palpable in all the severer cases and some of the milder examples, but never formed a visible mass, and were not tender. The mesenteric glands were palpable in a considerable proportion of the slighter cases. Abdominal pain occurred in several, in one instance suggesting appendicitis. In no case was the parotid affected. In several the superficial submaxillary lymphatic gland was visibly enlarged. The mass of glands diminished rapidly in size and was rarely visible after five or six days, but glands could be recognised on palpation after several weeks. In no instance did suppuration occur, though we feared at one time that it would do so in Case 2.

Fauces.—In no instance was there any exudation on the tonsils. In a certain number the "throat" was complained of, and in these the fauces were reddened profusely and appeared dry, and in several a tonsil was definitely enlarged. In many cases the fauces were unaffected. Several of the boys had had their tonsils removed previously.

Epistaxis.—This occurred in eight cases (Cases 2, 7, 8, 14, 21, 23, 24, and in 20 during relapse). In Case 7 it was profuse and repeated, and in Cases 14 and 20 it occurred several times. It was not confined to the onset. With regard to other symptoms, constipation was not a difficulty, and there was no instance of either diarrhœa or vomiting. The spleen was palpable in only one case (Case 10); the enlargement persisted until the end of the term, but we have since found that another factor was responsible for this. There was no instance of nephritis.

Relapses.—Definite relapses occurred in two instances (Cases 1 and 20); in Case 1 the boy had been taken home for convalescence, but owing to a recurrence of glandular enlargement and pyrexia the parents sent him back on June 25th, four weeks from the onset. In Case 20 the relapse occurred on July 1st, 25 days from the onset. The initial attack was slight and the temperature did not exceed 99·5°. On July 1st the temperature rose suddenly to 102·5°, and the glands enlarged. They reached a maximum in three days, forming prominent swellings on both sides of the neck. The temperature was over 100° for nearly two weeks. In Case 14 there was a slight relapse 21 days after the onset. Until the end of the term it was found that the boys were easily tired and somewhat lethargic both in work and in games, but recovery was finally complete in every instance. Treatment was symptomatic. All the boys are now in good health, two years later.

Examination of the Blood.—There were several difficulties in these examinations. It was necessary to avoid any appearance of "experimenting" on the boys. Some of the earlier cases also were removed by the parents after a few days in order to convalesce at home. A further point was that we were unaware that the lymphocytosis may take time to develop, and also that it may be very transitory; marked changes may occur in a few days. Longcope has referred to this in his article on Infective Mononucleosis. It is evident that a single blood examination may not show any very distinctive change. It was impracticable to take frequent counts on 24 boys, and it would probably have been better to have concentrated on a few cases. Blood counts are recorded in 19 cases. Case 10 must also be excluded as another factor was present. In the records the red blood cells and hæmoglobin are omitted; there was no appreciable degree of anæmia in any instance. The basophils have also been added to the polynuclear neutrophils. In no case was their normal percentage increased and the error is negligible. In no instance was there the degree of total increase of white cells and high percentage of lymphocytes which is recorded in many of the sporadic cases. There is, however, definite evidence of lymphocytosis. The greatest degree occurs in Case 4, who was temporarily removed by his parents a few days later, and in Case 14. It is also distinct in many of the others—e.g., Cases 8, 18, and 20. Case 14 exhibits the development of lymphocytosis. Case 2 is of interest; on May 29th the mass of glands was tender, the separate glands could not be recognised, and the appearance suggested that pus would form. This was the only case in

TABLE SHOWING BLOOD COUNTS OF TWENTY-ONE CASES OF GLANDULAR FEVER.

Case.	Date of onset.	Date of blood count.	Leucocytes per c.mm.	Polymorphonuclear neutrophils.	Polymorphonuclear eosinophils.	Lymphocytes.	Large mononuclears.
1. M. R. ..	20/5/21	29/5/21	5,100	63·5	2	31	3·5
		6/7/21	9,500	45·5	3·5	43·5	7·5
		15/7/21	8,600	48·5	4	38·5	9
2. J. R. ..	23/5/21	29/5/21	10,600	84	1	9·5	5·5
		6/6/21	9,600	67·5	2·5	26	4
		18/7/21	6,800	57·5	1	37	4·5
		23/3/23	—	65·5	3·5	28	3
3. S. D. ..	24/5/21	29/5/21	5,000	74·5	1	15	9·5
4. A. R. ..	25/5/21	29/5/21	13,800	28·5	2	64·5	5
		23/3/23	—	68	2	24	6
6. J. J. R.	27/5/21	29/5/21	7,800	50·5	3	43·5	3
		23/3/23	—	61	4	31	4
7. F. F. ..	5/6/21	18/6/21	8,300	52	1	37·5	9·5
8. C. K. ..	5/6/21	18/6/21	11,500	39	6	51·5	3·5
10. X. ..	6/6/21	18/6/21	4,200	44·5	3	50·5	2
		17/7/21	—	46	5	44	3
		23/3/23	—	50	2	45	3
12. D. N. ..	6/6/21	18/6/21	8,500	42·5	4·5	51·5	1·5
		23/3/23	—	58·5	1·5	34	6
13. J. B. ..	5/6/21	7/6/21	7,400	56·5	4·5	36	3
		23/3/23	—	53	2	41	4
14. G. H. ..	5/6/21	7/6/21	5,200	60·5	2·5	33·5	3·5
		19/6/21	13,500	36·5	3	56·5	4
		30/6/21	11,000	48·5	4·5	44·5	2·5
		15/7/21	6,600	52	3	42	3
15. K. H. ..	5/6/21	7/6/21	5,700	56·5	3·5	34	6
		19/6/21	8,600	42·5	3·5	49·5	4·5
16. C. D. ..	5/6/21	7/6/21	5,000	64·5	5	27·5	3
17. C. R. ..	5/6/21	18/6/21	—	44·5	5·5	44	6
18. M. A. ..	6/6/21	7/6/21	13,400	37·5	2·5	54	6
		23/3/23	—	52	1·5	43·5	3
19. H. P. ..	5/6/21	7/6/21	6,800	57	4	34·5	4·5
		23/3/23	—	69	1	26·5	3·5
20. R. B. ..	6/6/21	18/6/21	10,300	42	3	51	4
		17/7/21	7,000	50·5	0·5	46	3
21. J. R. ..	9/6/21	19/6/21	8,800	50	1·5	42·5	6
		23/3/23	—	49·5	2	43	5·5
23. T. H. ..	10/6/21	19/6/21	6,600	50·5	3·5	41·5	4·5
C. R.	10/7/21	12/7/21	18,000	26·5	3	65·5	5
		28/7/21	9,000	45	2	47·5	5·5
		8/4/23	—	65·5	1·5	28	5
C. H.	1/12/22	15/12/22	35,000	35	—	62	3
		20/12/22	24,000	59	—	35	6
		28/12/22	11,600	48·5	2	45	4·5
		15/1/23	7,800	46	3	40	11
		12/4/23	7,600	49·5	0·5	43	7

NOTE.—The numbered cases occurred in the epidemic. No examinations of the blood were made in Cases 5, 9, 11, 22, and 24.

which we suspected it. It is noteworthy that a polynuclear leucocytosis was present. Suppuration, however, did not occur, though the glands took much longer to subside than in the others. For purposes of comparison blood films have been recently obtained from several of the boys.

M. D., aged 6 years, daughter of the practitioner in medical charge of the school, developed glandular fever on June 10th. She had not been in contact with any known case, which suggests that the infection was conveyed by her father. It must, however, be stated that other cases were occurring in the neighbourhood, and a typical example was seen in consultation with another doctor. The daughter's attack was mild, and she was shortly convalescent. She was then allowed to go to a garden fête on June 29th. Here, contrary to orders, she was kissed by one girl friend, C. R.; this friend alone of those at the party developed glandular fever. Malaise commenced on July 10th, and by July 12th the cervical glands formed a prominent mass; the spleen was palpable, and the temperature 105°. The symptoms were characteristic of glandular fever, and severer than in any case at the school. Two blood counts are given of this case, the lymphocytes reaching 66 per cent. in a total count of 18,000 leucocytes. The attack followed the usual course and recovery was complete.

Sporadic Cases.

In addition to this epidemic eight sporadic cases have been seen which answered to the characteristics of glandular fever. In two instances hæmorrhagic nephritis was present, which brought the patient under observation. Several less definite cases have also been seen. The following are notes of a recent well-marked example :—

C. H., male, aged 3 years, admitted to the Royal Northern Hospital on Dec. 11th, 1922.

History.—Measles. Family history: unimportant. Present illness: for ten days slight malaise and swelling in the right side of the neck and right groin. Passed blood in a stool on day of admission; bowels previously normal.

Condition on Admission.—Face flushed, did not appear ill, no cough, temperature 102°, pulse 118, respirations 32. On right side of neck a prominent swelling due to enlarged glands; apparently not tender on manipulation. Right submaxillary lymphatic gland also enlarged. Right tonsil enlarged, but no exudation and no difficulty in swallowing. Teeth in good order. A few glands in axilla and groin. No mesenteric glands palpable. Liver and spleen not palpable. (Dr. S. W. Harlow, the house physician, is certain that he felt the spleen one day.)

Progress of Case.—Temperature fell to 99° in six days. The prominent swelling in the neck subsided in about two weeks. The submaxillary gland diminished more slowly. Cultures from the fauces were negative for diphtheria bacilli. Recovery was finally complete.

Examination of Blood.†—It will be seen that there is a high degree of lymphocytosis, both relative and absolute (Dec. 15th). On the 20th the percentage of polynuclear cells had risen to 59 per cent., practically owing to the rapid fall in lymphocytes. Subsequently the number of polynuclear and mononuclear cells were about equal, and resembled many of the examinations in the epidemic cases.

The following case may also be recorded :—

J. K., female, aged 9 years. Chicken-pox developed on June 13th, 1922. Doing well until the 19th, when respiration became very rapid and temperature rose suddenly.

Condition on Examination.—First seen on the 20th. Temperature 104°, pulse 120, respirations 40. Looked extremely ill and distressed. Mentally clear; no cough; some cyanosis; no local pain. Became very distressed if moved. Lungs: percussion note definitely impaired at left apex and right base. Breath sounds little affected. No adventitious sounds. The condition was puzzling, but it was suggested that pneumonia was developing.

Progress of Case.—On the left side dullness extended in about 24 hours to the whole lung. Breath sounds were broncho-vesicular, never tubular. No adventitious sounds developed either here or elsewhere in lungs throughout the whole course. No sputum; spleen never palpable; no enlarged glands; fauces clear. After three or four days a slight cough developed, not paroxysmal and never troublesome. Dullness on left now cleared rapidly, at the same time becoming more extensive and definite at right base. No displacement of heart; breath sounds audible and comparatively little altered. About this time very severe abdominal pain commenced, principally in the right upper quadrant. At this stage the patient was seriously ill, the temperature remaining over 104°, pulse about 140, and respirations rising to 60. No diagnosis was suggested which fitted the symptoms and signs satisfactorily. On the sixth day the temperature began to fall slightly.

The next day a younger brother, W. K., rapidly developed a large mass of glands on the right side of the neck. The condition appeared characteristic of glandular fever, and ran the usual course. The diagnosis was then made that in the girl's case there was enlargement of the mediastinal glands with resulting pressure on the bronchi and pulmonary collapse. The abdominal pain would be consistent with the frequency of these symptoms in glandular fever. The girl made a slow but uninterrupted recovery, the symptoms gradually diminishing, and both children are now in good health.

Discussion.

(1) *Is Glandular Fever a Clinical Entity?*—The description given at the commencement of this article applies, practically without variation, to nearly all the severe cases both under our observation and in the literature. It is accurate for the severer cases in the epidemic, for M. D. and for her friend C. R., for the sporadic cases which we have seen, including C. H., for the case published by Morley and one of us in 1921, for Pfeiffer's cases, and for cases since recorded in various countries. It is also accurate for the cases recorded as "infective mononucleosis," as "acute lymphatic leukæmia with recovery," for nearly all the cases of "lymphocytosis due to sepsis," and many cases under similar titles. Atypical and milder cases certainly occur, particularly in adults, and it is noticeable that the later cases in the epidemic were milder and slower in development than the earlier ones. If, for example, we consider the case C. H., it would, we think, puzzle a sceptic to find any other recognised entity under which it could be classified. The symptom-complex is characteristic, distinct from other diseases, and in our opinion sufficient to establish glandular fever as a clinical entity. In typical cases the diagnosis in fact is simple.

(2) *Are Glandular Fever and Infective Mononucleosis Identical?*—It has been stated above that the description of symptoms, progress, and prognosis applies equally to cases recorded under these two titles. Clinically they are indistinguishable. The proof that two separate conditions exist would have to rest on typical cases in which the blood had been followed through the course without the presence of lymphocytosis. No such evidence exists at the present time. It must be noted that it is not impossible for an occasional case to show polynucleosis; this occurred in Case 2 of our epidemic in which we thought clinically that the glands would suppurate. No doubt these acutely enlarged glands may become secondarily affected with pyogenic organisms, and suppuration occasionally occurs. A single count may be deceptive, and it is difficult to know what interpretation one would have put on the blood count on Dec. 20th in the case of the male aged 3. We consider that the evidence justifies the conclusion that an absolute lymphocytosis is the normal occurrence in glandular fever, and that glandular fever and infective mononucleosis are identical.

(3) *Nature of the Mononuclear Cells.*—In nearly all our cases it was very difficult to classify many of the cells as small or large lymphocytes. The main mass of protoplasm is usually greater than is normal in small lymphocytes and stains more deeply. The nucleus is less regular, and is frequently notched and often eccentric. There are no nucleoli. A considerable number of typical lymphocytes are always present. These abnormalities in the lymphocytes have been carefully described by observers of infective mononucleosis and also by previous recorders of such cases. The descriptions are practically all similar, and apply to other cases of glandular fever which we have seen. The nucleus of the most atypical cells have some resemblance to a small-sized Rieder nucleus. It was noticeable that in Case 1 during the relapse the mononuclear cells were

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† For the examination in this case we are indebted to Dr. E. H. Shaw and Dr. P. O. Ellison. For all others we were personally responsible.

mainly typical large lymphocytes, the differential count on July 6th, 1921, being: large lymphocytes 38·5 per cent., small lymphocytes 5 per cent. In agreement with Longcope, Sprunt and Evans, and others, we consider that the cells are lymphoid in origin. These points are of interest to hæmatologists, but they are not of great importance clinically. We regard the cells as slightly immature lymphocytes. Longcope states that "the leukocytosis is dependent entirely upon an actual increase in the non-granular forms of mononuclear cells." This is almost, but not quite, invariably so. Thus in one of Longcope's cases (Case 6) there was at one time a leucocytosis of 26,200, with 60 per cent. of polynuclear neutrophils. In the case of C. H. here recorded, there were present on Dec. 15th 12,000 polynuclear neutrophils, and on Dec. 20th 14,000. It may also be noted here that a leucopenia may occur. This is mainly due to diminution of granular cells. It is not uncommon for the total leucocytes to be within normal limits.

(4) *Relation to other Diseases.*—The condition we are considering is an acute, infectious, contagious, and transient disease producing an absolute and relative lymphocytosis. From this standpoint the number of diseases we have to refer to is very limited. The numerous chronic conditions which produce only relative lymphocytosis and not an absolute increase need not be considered.

(*a*) So many of the recorded cases had previously had whooping-cough that it cannot be considered that any connexion exists. The same argument also applies to mumps, scarlet fever, and measles, though, of course, in these diseases an absolute lymphocytosis does not occur.

(*b*) There is no evidence that an acute leukæmia is infectious, and so far as we know there is no record of an epidemic. The clinical condition in glandular fever bears no relation to the grave constitutional disturbances of acute leukæmia. Recovery is complete in nearly every case. The clinical differences between the two diseases are so extreme that it is incredible that they can be due to a common factor. Differences between the leucocytes in glandular fever and acute leukæmia have been described, in close agreement, by several observers. While agreeing with these from our own observations, we doubt whether a pathologist, from consideration of these points without other information, could at present give a definite diagnosis between the two conditions, though it may become possible to do so. We may perhaps note that one form of leukæmia in fowls has been proved to be transmissible to healthy animals by inoculation.

(*c*) In infancy there is a tendency for lymphocytes to increase under simple conditions which do not have this effect in older children or in adults, but this has no relation to glandular fever.

(*d*) Certain forms of generalised neoplasm are occasionally associated with lymphocytosis. The condition is neither transient nor infectious, and obviously has no relation to glandular fever.

(*e*) With regard to septic infections, it has been stated above that the fauces are frequently reddened in glandular fever. Sometimes a tonsil may be swollen. This is the usual limit of the changes and any definite tonsillitis is rare. Not uncommonly there is no obvious change and no complaint of sore throat. There is no evidence that oral sepsis or dental caries has any connexion with glandular fever. Sepsis is frequently stated to be a rare but occasional cause of absolute lymphocytosis. In our own personal experience we have never seen an example. So far as we can ascertain this is based almost entirely on articles by Türk in 1907, by Marchand and by Cabot in 1913, and by Deussing in 1918. Study of these articles reveals no evidence for the statement. The cases of which clinical data are given can be divided into two categories—cases of acute leukæmia which were fatal, and cases of glandular fever which recovered. A striking point in these articles is the frequent absence of any evidence of sepsis. Another point is the absence of recognition that in acute leukæmia the leucocytes are frequently not increased in number. In 24 cases of acute leukæmia, which Panton and one of us (H. L. T.) published in 1914,‡ there were 11 cases in which counts of under 10,000 were recorded, and six cases of counts under 4000. Absence of recognition of this leucopenia has led many writers to attribute the leukæmia to some subsidiary septic lesion. In our opinion the statement that sepsis occasionally produces lymphocytosis is without foundation.

(5) *Nephritis.*—The amount of blood which is passed has struck most observers, especially as the usual symptoms of nephritis are certainly generally absent. The prognosis is good. It is doubtful whether a typical attack of acute nephritis ever occurs; there is no record of such an occurrence in the literature, though the condition of the urine suggests that the kidneys must sometimes be definitely affected. Little is known about this complication, which is worthy of consideration from the standpoint of nephritis.

(6) *Degree of Infectivity.*—It is difficult to arrive at a conclusion on this point. Cases have been nursed in hospital wards without special precautions, but we have never seen an instance of infection in such circumstances. It is usually stated that the incubation period is commonly seven or eight days, but the epidemic here described suggests that it is more often 10 or 12 days.

Diagnosis.

In glandular fever attention may be directed especially to the mildness of the constitutional symptoms even when the temperature is high, to the rapidity with which the glands enlarge, to the very prominent mass which they often form, and to the absence of anæmia. In one of these cases (W. K.) it is certain that the glands were not enlarged to any extent in the morning, while in the evening they formed a mass almost the size of a fist.

Acute Leukæmia.—A diagnosis is not difficult on clinical grounds. In acute leukæmia the patient is seriously ill, while in glandular fever the constitutional disturbance is nearly always mild, especially in comparison with the enlargement of the glands. An equally important point is the absence of anæmia. On the examination of the blood it would be impossible in some of the cases for a pathologist to make a definite diagnosis between leukæmia and glandular fever, but, on the other hand, it is improbable that any clinician bearing glandular fever in mind would make a mistake between the two diseases. Even apart from recollecting glandular fever, leukæmia would rarely suggest itself. The medical man who sees a case thinks not of leukæmia but of mumps or of tonsillitis. He is usually somewhat puzzled, and while he is puzzling the glands subside and the patient recovers. Sometimes he removes a carious tooth, and recovery is ascribed to this. The transient nature of the marked swelling and the usual absence of severe symptoms is the reason why the blood is so rarely examined in a condition which is comparatively common.

Mumps.—Outbreaks of glandular fever and also sporadic cases are frequently diagnosed as mumps, or perhaps even more commonly as "aberrant mumps." We have never seen the parotid gland affected in glandular fever, but the pre-auricular lymphatic gland may enlarge, and the superficial submaxillary lymphatic gland often attains a large size. The absence of pain is a practical difference. A mistake in diagnosis between these conditions would in point of fact be of little importance.

Tuberculosis.—There is no doubt that some cases of glandular fever have been diagnosed as "acute tuberculous adenitis." The serious results of such an error are obvious. The recognition of the existence of glandular fever should be sufficient to prevent a mistake which may affect an important period in a child's life. The diagnosis of "acute Hodgkin's disease" has also been made.

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‡ Quarterly Journal of Medicine.

Tonsillitis.—Septic tonsillitis is often extremely infectious. The constitutional symptoms are usually severe, suppuration is common, and there is a considerable mortality. Simple tonsillitis is, of course, very common, and if anyone who is subject to it contracts glandular fever there may be a co-existent tonsillitis, but the striking point in glandular fever is the slightness of the changes in the fauces compared with the marked enlargement of the glands. It is obvious that the causes of local sepsis in the scalp and elsewhere must be searched for and excluded as far as possible.

Conclusions.

1. Glandular fever is a clinical entity.
2. An absolute lymphocytosis is a normal occurrence.
3. Glandular fever and the condition described as infective mononucleosis are identical.
4. Recovery is permanent, and there is no relation to leukæmia, Hodgkin's disease, or tuberculosis.
5. There is no evidence that sepsis is a cause of absolute lymphocytosis.

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TRAUMA AS A POSSIBLE CAUSE OF BRAIN TUMOUR.

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IT is a common occurrence for parents to ascribe an injury to the head as the cause for mental deficiency, epilepsy, infantile diplegia and hemiplegia, anterior poliomyelitis and other nervous affections—such injuries, which most individuals suffer from sooner or later in greater or lesser degree, having, however, nothing whatever to do with the disease in question. The only exception to this would be a true traumatic epilepsy from direct injury to the motor cortex, or where a blow on the head, possibly only slight, seems to be the exciting cause of starting essential epilepsy in a predisposed subject.

One is thus prejudiced against considering blows on the head as causes of cerebral disease, including cerebral tumour. But cases arise from time to time which make one wonder whether injury to the head may not after all be a causative factor of brain tumour. Medico-legally this point is of the greatest importance. One may "think" a head injury has caused a tumour, but legally the opinion given must be beyond "mere surmise, conjecture, or guess."

Literature of the Subject.

On looking up authorities one is surprised to find how indefinite opinions are as a rule. Thus Gowers[1] says: "There is little doubt, however, that traumatic influences, falls and blows on the head, are occasionally the immediate excitants of a growth, since the symptoms have been observed to follow a blow, and the tumour is found to correspond in position to the seat of the injury. Such a relation has been observed in almost all forms of tumour, especially in syphilitic and tubercular growths and in sarcomata of the dura mater. . . . Apparently the nutritive changes consequent on a mere concussion may be the starting point of a tumour. In some cases local symptoms of irritation, which were continuous with those of a subsequent tumour, commenced two or three days after the injury. . . . But the cases in which a traumatic cause can be traced form a very small proportion of the total number and the extent of this influence may readily be overrated. It should be remembered that a fall may evoke symptoms which existed before the accident."

Ross[2] says: "Injuries of the skull act as exciting causes in the production of cerebral tumours. Several cases have come under my own observation in which the disease dated from a blow on the head, and the tumour in these cases frequently grew at a place corresponding to the seat of injury." Byrom Bramwell[3] says: "Traumatic injury is in some cases undoubtedly a proximate cause [of tumour], especially in the case of tuberculous, syphilitic, and gliomatous new growths." Van Gehuchten[4] says: "Dans certaines circonstances on tend à incriminer le traumatisme, surtout pour les gliomes et les sarcomes, mais l'influence du traumatisme sur l'éclosion des tumeurs cérébrales est loin d'être prouvée."

In considering this question I have gained much valuable information from Prof. James Ewing's book, "Neoplastic Diseases," and from it I take the following statements and references. He says:

> "There seems to be no sufficient reason for denying the relation between trauma and many chondroma, osteoma, lipoma, fibroma or fibro-myxoma with which the history of a blow is rather common—also with the most striking forms of traumatic tumour, gliosarcoma and osteosarcoma where a definite history of injury is frequent. To establish relationship several classes of evidence are necessary, as is recognised especially by French statutes: (1) The authenticity and sufficient importance of the trauma; (2) previous integrity of the part; (3) a reasonable time-relation, three weeks to three years; (4) continuity of pathological changes or symptoms in the wounded part and the appearance of the tumour; (5) microscopic proof of the existence of the tumour. When a healthy adult receives a blow on the head, remains unconscious for days, never recovers full mentality, shortly develops signs of brain tumour, and dies in a few months of gliosarcoma—the liability is generally accepted as complete."

Gerhardt gives 10 in 60 reported cases; Adler[5] in over 1000 cases gives 8·8 per cent. as due to trauma, and details 118 cases of various types, illustrating many possible relations to trauma, some of them quite direct. Trauma may be a direct exciting cause of the tumour as shown by the injury causing a lesion of the dura or pia with affection of brain tissue. Less satisfactory and more numerous are those cases in which the tumour appears at some point remote from the injury. Starr assumes, probably correctly, that a cerebral hæmorrhage or contusion may pass directly into a tumour process.

Mr. Geoffrey Jefferson, hon. surgeon to the Salford Royal Hospital, who is specially interested in neurological surgery, tells me of the following case:—

> A woman, aged 35, fell against a piece of machinery, striking the right side of the head; she ever after suffered from headaches over the vertex and then very severe in the sub-occipital region. She then commenced with occasional vomiting and sometimes to fall backwards, and her eyesight began to fail. When Mr. Jefferson first saw her six months after the injury, she could not stand without support, leaned heavily backwards, saying she was afraid she was going to fall on her face, said the room was spinning round from left to right. There was double optic neuritis and nystagmus rapid to right, slow to left; no ocular paralysis, but slight numbness of left face. A bilateral sub-occipital trephining was performed; no tumour was found, but she died the same evening from shock. At the autopsy a right-sided glioma involving the midbrain and with an extra-cerebral projection of growth which lay between the tentorium cerebelli and the upper surface of the right lobe of the cerebellum; the growth also involved the posterior part of the substance of the right hemisphere.

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[1] Diseases of Nervous System, vol. ii., p. 490.

[2] Ibid., vol. ii., p. 416.

[3] Allbutt's Syst. of Medicine, first edition, vol. vii., p. 646.

[4] Les Maladies Nerveuses, p. 467.

[5] Arch. f. Unfallheil., 1897, ii, 189.

Mr. Jefferson tells me that he has had under his care about 1000 cases of injury of the head, civil and military, and of these has only seen three cases of brain tumour. He doubts if a single trauma can start a growth and thinks it more likely that when it apparently does so it is only by "stirring up" a growth which was already present.

Personal Experience.

I regret that I cannot give definite statistics of my own, but I can certainly say that very seldom in my personal practice have I been able to ascribe brain tumour to injury. The two following cases are of interest:—

Case 1.—In November, 1898, a finely built man, aged 46, consulted me. Three years previously he had a fall on the back of the head while skating and he was stunned for a time but not definitely unconscious. Two years afterwards he commenced with pain at the back of the head with some giddiness. In July, 1898, he found his right foot would not quite respond to his will and in August he could not write as well as usual; in September he was somewhat unsteady in gait and had acute pain at the back of the head; then found a difficulty in pronouncing words and in clear articulation. He had no vomiting.

Condition on Examination.—When I saw him he was slightly unsteady in gait and when standing with the eyes closed reeled over backwards and to the right; there was pain and some tenderness at the back of the head; the right knee-jerk was more lively than the left, and there was some slight weakness of the right arm and leg; his speech was a dysarthria (not an aphasia); pupils and optic discs were normal; no tremors; but writing very irregular, and both hands ataxic and awkward on attempting fine movements.

Course of Case.—A diagnosis of a tumour of the middle lobe of the cerebellum was made. I saw him again in ten days when he told me he had had three sudden attacks of vomiting. A few days after this he became rapidly worse with some stupor, emotionalism, and standing and talking were impossible. The late Sir William Thorburn operated on Dec. 23rd, trephining the left side sub-occipital region; the dura mater bulged greatly into the wound and was opened on Dec. 25th with a great discharge of clear fluid but no tumour was found. The patient became more sensible for a few days, then coma set in and he died on Jan. 1st, 1899.

Post Mortem.—A soft myxoglioma, the size of an average walnut, was found in the middle lobe of the cerebellum, three-fifths of it being to the right and two-fifths to the left of the middle line.

Case 2.—On May 22nd, 1922, I was called to see in consultation a well-built, healthy-looking Jewish gentleman, aged 35, and was told that on March 24th, 1922, he had been knocked down by a motor-car and received bruises on the right hip and right side of the head; he was stunned but able with assistance to get home, only about a quarter of a mile away. After a few days rest he went to Blackpool to convalesce, but returned no better.

Condition on Examination.—When I saw him he merely complained of tingling and numbness of the left side of body and limbs with some headache. He was very nervous about his condition and very emotional, thought the right side was also getting affected, and said he was sure he was going "to have a stroke and would become lifeless." A full examination, including, of course, the optic discs, revealed no abnormal physical signs and no loss of sensation could be detected, and I considered that he was a case of traumatic neurasthenia.

Course of Case.—He returned to Blackpool and while there began to lose power on his left side. On returning home he went to the Manchester Royal Infirmary and after examination in the out-patient department was considered to be a "functional" case, but he was sent into the wards and detained there for seven weeks. During this time the left hemiplegia slowly became worse and he was taken home by his wife on August 3rd, 1922, and I was asked to see him again on that day. He was then very ill, slightly delirious, with total left hemiplegia and hemianæsthesia, immobile pupils, and double optic neuritis. On August 14th Mr. Jefferson trephined over the right motor area, there was intense bulging of the brain into the wound, but nothing definite was found. The patient died the next day.

Post Mortem.—A soft gliosarcoma was found in the right optic thalamus and invading the internal capsule. At the inquest it was considered that the tumour had no connexion with the accident, but the friends commenced a civil action which was settled out of court by the insurance company paying £550.

It is most difficult to decide whether these cases really show any causal relation between trauma and tumour, or whether they are examples of that frequent and incalculable factor in estimating causation—namely, coincidence.

I have brought this question forward in the hope that others will make full inquiry regarding any comparatively recent injury to the head in cases of brain tumour and to elicit the experience of others.

Clinical and Laboratory Notes.

TWO CASES OF
ENCEPHALITIS LETHARGICA
WITH SCARLATINAL DESQUAMATION.

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Two cases of encephalitis lethargica under my care have both presented the feature—unusual so far as I am aware—of desquamation closely simulating that of scarlet fever.

Case 1.—A young man, aged 17, employed as a fitter at a large omnibus garage, complained first of pain in right knee, thought to be a sprain caused while cranking up a 'bus. A week afterwards he developed acute mental symptoms, delirium and excitability, part of the delirium taking the form of "*occupational soliloquies.*" Removed to the union infirmary as a mental case, and remained there for several days. It was then noticed that his hands were undergoing the typical "glove" peeling so characteristic of severe cases of scarlet fever. His toes also showed signs of desquamation. I was requested to see him with a view to confirming the diagnosis of scarlet fever. After some hesitation I agreed to admit him to the Wrexham Fever Hospital, as there was an indefinite history of vomiting and sore throat some weeks previously. This has since proved incorrect.

On admission, on March 2nd, 1923, to the East Denbighshire Fever Hospital, all acute mental symptoms had disappeared. He was very somnolent, waking up only when roused at meal-times, &c. Superficial and deep reflexes were present, but sluggish. There was incontinence of urine. Sane answers given to questions, but in a slow and hesitating manner. Memory very poor. Desquamation on hands complete in about a week, but contrary to what would have taken place in scarlet fever the dead skin came away in small pieces and left behind a roughish surface. No desquamation elsewhere except over a small area in the dorsal region of the back. Somnolence and lethargy lasted for two weeks, and was followed by a short period of irritability. Recovery is now almost complete, except for a certain listlessness and slurring speech. Described by his mother as having been a very bright and cheerful boy before this illness.

Case 2.—Admitted to the Wrexham Fever Hospital on March 10th, 1923, from the Wrexham General Infirmary as a case of encephalitis lethargica. He appeared to be a fairly typical case with marked somnolence, ptosis, nystagmus and diplopia. waking up when spoken to, and answering questions in a slow monotonous voice. Quite fair appetite; reflexes normal except Babinski + in the right foot. Incontinence of urine at first, ceasing as lethargy passed off. Shortly after admission his feet, hands, and legs commenced to desquamate, not quite so markedly as in Case 1, but sufficiently so to make it a fairly typical "glove" desquamation of scarlet fever. As in Case 1, there was no peeling on the neck and chest. After peeling the palmar surface of the hands and the plantar surface of his feet presented the same rough appearance as in Case 1. This case is running a protracted course, but practically all visible skin changes have now ceased.

I have been unable to find any similar case of such marked desquamation recorded in the literature on encephalitis lethargica. In the report of Dr. A. C. Parsons to the Ministry of Health there is, however, what may be a parallel case (Case 673/1919). Here it had been noted that there was a faint rash on the chest, and this was followed by desquamation—the inference drawn being that the case was one of encephalitis lethargica combined with scarlet fever. I venture to suggest in the light of the two cases I have had under my care that desquamation may be added to the already manifold signs of encephalitis lethargica. The close similarity of the desquamation to that occurring in scarlet fever might deceive anyone not well acquainted with the latter disease; but, as I have pointed out, the appearance of the skin after desquamation had taken place was sufficient to show that the peeling was not that associated with scarlet fever.

London.

A NOTE ON A
HELMINTH SURVEY OF A GURKHA BATTALION.

BY R. C. WATTS, M.D. LIVERP., D.P.H., D.T.M.,
CAPTAIN, I.M.S.

THE original idea of the work undertaken was an investigation of ankylostomiasis among Gurkha soldiers who come from a part of India where the disease is prevalent.

Procedure.—A number of labels bearing men's names, numbers, &c., were distributed daily amongst the Gurkha Rifles. These men were instructed to defæcate into clean latrine pans set apart for them. After defæcation the man handed over his label to the sweeper, who took a specimen of the fæces in a gallipot, labelled it, and sent it to the laboratory. In this way the whole unit was examined.

The concentration methods were not used as they take too long, and are not practicable with restricted facilities. The ordinary method of dissolving a loopful of fæces in normal saline and putting under a cover-slip was used. The results are summarised as follows: Number of cases examined, 561; number of cases infected, 139 (ankylostomiasis, 8·5 per cent.; ascariasis, 12·2 per cent.; trichocephaliasis, 4·6 per cent.).

The routine method used in the laboratory was as described above, but an observation was also made as to the effect the harbouring of worms had on the human host. The cases can be divided into three categories: (1) Cases having infection without being inconvenienced or showing any signs whatever; (2) cases having some other diseases which may mask signs of helminthic infection; (3) cases in which anæmia is marked. Though no definite figures can be given, a rough estimate under the above classes is: (1) 81 per cent., (2) 17 per cent., (3) 2 per cent.

Results.—Recruits taken by themselves showed an infection with ankylostomes in 20 per cent., but owing to good sanitary conditions in the lines individuals are not reinfecting themselves or infecting others. Probably this is the reason why the men with longer service show a smaller percentage of infection than the younger men. Though it is well known there are many who harbour ankylostome worms and enjoy good health, yet at some time or other the parasites may produce serious effects. For this reason treatment was carried out. Men were taken into hospital and treated with 60 gr. doses of thymol. The stools were examined for worms, which were collected for examination. It was found that all the worms were *Necator*, and that on the average three doses of thymol were required before a patient's stools were free of ova.

In conclusion, I have to thank Lieut.-Colonel H. M. Cruddas, I.M.S., for valuable suggestions.

Abbottabad, India.

QUEEN'S UNIVERSITY OF BELFAST.—The Marquis of Londonderry has been elected Chancellor of the University in succession to the Earl of Shaftesbury, resigned. The election, which rests with the Members of Convocation, was unanimous.

THE FLOWER HOUSE, CATFORD.—On Saturday, July 14th, Sir Henry Fielding Dickens, K.C., will lay the corner stone of an extension to accommodate invalid ex-officers at the Flower House, Catford, S.E. 6, when there will be a reception by Major Pat à Beckett and Major and Mrs. Walter à Beckett at 4.30 P.M.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

SURGERY OF THE HEPATIC AND COMMON BILE-DUCTS.

A MEETING of this section was held on June 27th, with Mr. JAMES BERRY, the President, in the chair, when Dr. WILLIAM J. MAYO opened a discussion upon this subject. Dr. Mayo's paper was published in THE LANCET last week, and the contributions of Sir BERKELEY MOYNIHAN and Mr. JAMES SHERREN, who followed, will be found on pp. 4 and 7 of our present issue.

Mr. G. GREY TURNER referred to

Cases of Surgical Injury to the Larger Bile-Ducts

which had occurred in his own practice. Case 1 was operated on for gall-stones; the gall-bladder and duodenum were wrapped in omental adhesions, during the separation of which an unsuspected diverticulum of the duodenum was opened. This was temporarily clamped and the gall-bladder, which was full of stones and apparently of hour-glass form, was removed after exposing what was thought to be the cystic duct. After the removal of the gall-bladder there was a leakage of bile, and investigation showed that the common duct had been inadvertently divided. The duodenal diverticulum, which contained a pancreatic process in its wall, was excised; as this caused considerable narrowing of the gut, the pylorus was occluded and a posterior gastro-enterostomy was performed. Investigation of the bile-duct injury then showed that at least an inch had been excised, but the ends were easily brought together and united by end-to-end suture. The patient unfortunately died of a duodenal and pancreatic fistula four weeks after operation. At the necropsy the bile-duct was found intact, although the parts were much altered by auto-digestion; other diverticula were found springing from the duodenum and upper three feet of the jejunum. Had it not been for the other complications the patient would probably have survived the injury to the bile-duct.

In Case 2 cholecystectomy was performed for gall-stones, what was taken for the cystic duct being ligatured in the usual manner. A biliary fistula appeared after operation, but this had healed on discharge from hospital three weeks after operation. After discharge the biliary fistula recurred, but healed after a month, the healing being followed by jaundice and severe pain. Four months after operation the patient, now deeply jaundiced, was readmitted, and after a few days' preparation the abdomen was reopened. After freeing the region of the biliary ducts from adhesions, the lower end of the common bile-duct, which had been divided in the first operation, was found just above the duodenum. The upper end was, after great difficulty, identified in a mass of dense scar-tissue under the liver by puncture with a hypodermic needle. During this dissection the cystic artery was injured and had to be secured by a clip, which was left in situ at the end of the operation as it was impossible to ligature the vessel. The ends of the duct were then fairly easily approximated over a rubber tube after Sullivan's method. The patient, who had stood the operation quite well, died in 48 hours from hæmorrhage into the abdominal cavity and into the cellular tissue about the hepatic omentum, duodenum, and pancreas. The junction of the bile-duct was satisfactory, but the rubber tube had been introduced too far, and had passed up the left hepatic duct to the centre of the liver. It was obvious that a mistake had been made in attempting to perform an anastomosis in the presence of deep jaundice; the indication was to open and drain the hepatic duct, and to leave the repair till a later occasion.

Case 3 was that of a stout female, aged 41, operated upon for recurrent gall-stones, cholecystectomy and gastro-enterostomy being performed. A bile fistula persisted for two weeks, and after it closed the patient became thin, developed a pale-lemon colour, and passed clay-coloured stools. Occasionally she had pain with pyrexia and definite jaundice, although in the intervals she was fairly well. A diagnosis of an increasing stricture of the common bile-duct became obvious and the biliary apparatus was explored at a second operation nearly two years after the first. The common duct was, with some difficulty, identified and opened below the obstruction, where the lumen was so narrow that a fine probe only could be passed. The stricture was divided and the duct reconstructed by a modification of Sullivan's method. Bile was discharged from the wound for a fortnight, and even when the fistula closed did not find its way into the intestine in any quantity. Three months after the operation the patient was, however, much improved; the fæces were of normal colour, but the tube had not appeared. The remarkable feature of the case was the fair health of the patient in the interval between the two operations, in spite of a severe stricture of the common duct.

Case 4, a male, aged 36, had a cholecystostomy performed as an emergency operation in February, 1922, his condition at that time precluding any more extensive operation than the removal so far as possible of stones and drainage. Although recovery followed, further attacks of gall-stone colic necessitated a further operation three months later. On this occasion cholecystectomy was performed with considerable difficulty owing to rigidity of the powerful abdominal muscles and the obscurity of the parts from adhesions. At the operation it was recognised that a small portion of the common duct had been excised; this opening was used to extract stones from the lower end of the duct and was then sutured. On the removal of the support behind the loin the parts came well together, but some bile leakage persisted for three weeks; after four weeks he was able to return home apparently cured. Shortly afterwards the wound reopened and discharged bile, and in spite of this he had pyrexia and persistent jaundice. Accordingly he was readmitted ten weeks after the last operation. After three days spent in preparation, the abdomen was again opened. There were very dense adhesions between the under surface of the liver and the situation of the bile-ducts, and the sinus had to be traced through these to the upper end of the common duct. The latter had become obliterated at the site of the injury and all the bile was finding its way through the fistula. In this case the lower end of the duct could not be identified, so the upper part was therefore anastomosed to the duodenum which had to be mobilised to allow union to be made without tension. The crescentic opening in the duodenum wall was at least half an inch in length and mucous membrane was united to mucous membrane. A small rubber drain was brought to the surface from the neighbourhood of the union. Two days after the operation there was distinct jaundice, but this soon passed off and in three weeks the patient was very well, the wound was healed, and the fæces contained a normal amount of bile. Two months afterwards he had a slight attack of pain with transient jaundice. These attacks were repeated and five months after operation he had a severe one accompanied by a rigor. This unfortunate man was accordingly readmitted in January, 1923. He was then slightly jaundiced following a recent attack. Because of the intermittent nature of the attacks and the comparatively good condition between them, the question of the possibility of further stones in the common duct was raised, and yet another operation was advised and was carried out on Feb. 3rd, 1923. The region of the duct was exposed with difficulty. No stones were felt and the duct was not dilated enough to identify or to incise. The duodenum was therefore opened and after great difficulty the new opening of the common bile-duct was found. It was very tiny, only admitting a fine probe; this was followed by bougies, until the opening easily admitted a No. 10 catheter. A portion of the latter was left in situ and fixed by a stitch. An artery was divided which could only be secured by clips left in situ. During convalescence there was slight bile leakage, pyrexia, and a tinge of jaundice. Early in June he was very well.

Points Affecting the Repair of Surgical Injuries.

These cases were quoted in order to demonstrate how much care should be exercised to avoid injury to the bile-ducts, and how, in spite of opinions to the contrary, the tendency after injury to the ducts was towards obliteration or stricture rather than towards restoration of function, even when immediate steps were taken to repair the injury. The multiplicity of operations described for the repair or reconstitution of the bile-ducts suggested that injury to them was not uncommon. Surgical injury could only be avoided by the identification of the hepatic and common ducts before the supposed cystic duct was clamped and divided. In dealing surgically with the larger bile-ducts the following facts should be borne in mind. (1) The ducts are elastic, and not only retract when divided but their ends also contract, thus favouring obliteration. (2) Except when fixed by inflammation they lie loosely among tissues which form a natural sheath in which hæmorrhage or extravasation of bile tends to be confined—the former aiding the obliterative process. (3) The mucous membrane has great recuperative power and tends to grow out along the duct, and is therefore very helpful in bridging a gap. (4) Ducts do not atrophy appreciably or become obliterated from disuse, but only as the result of inflammation. These considerations showed that the most important point in repair was to secure approximation of the ends of the ducts. The suture line should be the widest part of the duct, and too many sutures should not be employed as they were apt to cause narrowing. It was better to avoid the contact of any foreign body with the suture line. In these operations every possible aid to exposure should be employed; while the importance of the Mayo Robson position was universally recognised, the assistance given by the "reversed Trendelenburg" position was not so generally known.

Exploration of the Ducts.

He could not agree with his former master, Sir Berkeley Moynihan that it was unnecessary to open the common duct when symptoms pointed to the presence of stones, as small stones and soft detritus might easily escape detection by external palpation. When the duct was not large enough to admit the best probe, the finger, he employed the Desjardins forceps both for exploring the duct and for the removal of stones. The operation could not be considered complete, as the opener (Dr. Mayo) had taught many years ago, until a sound had been passed from the opening into the duodenum; for this purpose the speaker employed a female bladder sound three-sixteenths of an inch in diameter, thus dilating the opening of the bowel and ensuring the escape later of any stones missed during operation. The success of this manœuvre was indicated by the common occurrence of one attack of colic during convalescence. While he was interested to hear the remarks of Dr. Mayo as regards suture of the opened ducts, his own experience led him to regard drainage as the safer proceeding in any case of doubt. The greatest advances in the surgery of this region of recent years had been rather in the choice of the time for operation and in the preliminary and after-treatment than in the actual operative technique. He was convinced that the two-stage operation would save lives in the very toxic or jaundiced cases, but the need for this measure was growing less with earlier recognition of gall-stone disease and earlier operation.

Mr. Turner then described a specimen, shown at the meeting, of an enormous cystic dilatation of the common bile-duct, due, he suggested, to valvular obstruction which acted in similar manner to the valvular obstruction of the ureter, producing hydronephrosis. He also suggested that the enormously dilated common ducts sometimes seen associated with only small gall-stones, or none at all, were congenital anomalies allied to the congenital dilatation seen sometimes in the colon or ureters without any obvious cause. A further anomalous condition he had seen was the leakage of bile from apparently intact ducts sometimes associated with pancreatitis but occasionally without. Mr. Turner also suggested that the investigation by making plaster or gelatin casts of the lumen of the common bile-duct, to discover or disprove the presence of pouches in which stones might be overlooked, might be a useful field of study for surgical anatomists.

Reconstruction of the Ducts.

Mr. A. J. WALTON said that in these days, when so many operations were being performed in this region, it was essential that surgeons should have a clearly defined line of procedure for reconstruction of the ducts. Such an operation might be required for several conditions.

1. *Accidental Injury to the Common Bile-duct.*—Pathological lesions of the gall-bladder frequently led to changes in the anatomy of the parts which normally showed considerable variations in the origin and course of the cystic artery and in the length and position of the cystic duct. These variations, normal and pathological, unless they were well known, frequently led to injury to the common duct in the operation of cholecystectomy, which was now almost universally advocated as the operation of choice in gall-stone disease. The cystic artery might lie in front of the cystic duct; its unexpected division and retraction into the gastro-hepatic omentum led to the obscuring of the parts by hæmorrhage, and attempts to clip the vessel in the depths of the wound might easily lead to the inclusion and crushing of the common duct in the grasp of the forceps. Again, the cystic duct and the common duct sometimes ran parallel and were closely adherent; in this case both ducts might be divided, the common duct being mistaken for a portion of the cystic duct. When it was the more usual practice to remove the gall-bladder from the fundus backwards tension upon the freed gall-bladder might result in a loop of the common duct being pulled up and completely excised. As a result of inflammatory adhesions Hartmann's pouch of the gall-bladder might be firmly attached to the common duct; an incomplete dissection would then lead to the division of the common duct in mistake for the cystic. The only way to avoid these accidents was to make it a definite rule that in performing cholecystectomy nothing was divided until all three ducts, the common hepatic, the cystic, and the common bile-ducts, had been exposed by an incision in the upper part of the gastro-hepatic omentum. It was equally important that the cystic or any abnormal artery should be ligatured before it was divided.

2. *Congenital Absence of the Cystic Duct* was a very rare condition which necessarily involved removal of a portion of the common bile-duct during the operation of cholecystectomy. This should be observed and the continuity of the ducts restored at the time.

3. *Early Pancreatic Obstruction.*—In cases of this kind, when the gall-bladder was the seat of inflammatory disease or contained stones, the operator might proceed to remove the gall-bladder, failing to recognise an obstruction to the common bile-duct lower down. Later the line of suture might give way, leading to a permanent biliary fistula. At the second operation the lower portion of the duct was collapsed and might be so fibrous as to be undiscoverable; some operation would then be necessary to unite the upper patent end of the duct to the duodenum.

4. *Advanced Cases of Chronic Pancreatitis and Carcinoma of the Head of the Pancreas.*—As a rule these cases were associated with deep jaundice, a distended gall-bladder containing dark bile, and a dilated common duct as well as a hard and nodular pancreas. Rarely, however, long-continued obstruction led to absorption of the bile pigments, so that the bladder and passages were filled with mucoid-like fluid; if the gall-bladder were aspirated this condition was liable to be mistaken for obstruction to the cystic duct and the common duct might be opened to settle the diagnosis. There was then a danger of leakage from the common duct even if the opening were closed by suture and the pressure relieved by a cholecystenterostomy. A second operation to cure the biliary fistula would show an atrophied and fibrous lower end of the duct, the upper part alone being patent.

5. *Combined Disease of the Gall-bladder and Common Duct.*—It was important to realise that a growth in the bile passages might coexist with gall-stones and even with a carcinoma of the gall-bladder. In Mr. Walton's 262 cases of cholelithiasis there were seven cases of carcinoma of the gall-bladder, ten of the common duct alone, and five of carcinoma of both the common duct and gall-bladder. Carcinoma might occur at the junction of all three ducts, in the common hepatic duct above the cystic duct, in the common bile-duct, or at the ampulla. In the former two cases cholecystenterostomy would not relieve the obstruction, and in the latter two cases cholecystenterostomy would only be suitable with a healthy gall-bladder; when the gall-bladder was diseased or collapsed the only feasible operation was the anastomosis of the duct to the duodenum.

6. *Obstruction of the Duct by a Scar.*—It was stated as an objection to the routine performance of cholecystectomy that the gall-bladder was no longer available for cholecystenterostomy should the common duct become obstructed later. Such obstruction was very rare.

Operative Technique.

The operations to be performed for any one of the above conditions were numerous, and would naturally differ according to whether the duct were dilated or leaking. The operations of choice were the following.

1. *Direct Suture.*—In cases of surgical injury to one of the ducts, and sometimes when a small carcinoma had been excised, this would appear theoretically to be the operation of choice. As a matter of practice, however, direct suture was often a matter of difficulty, the ducts being small and in the case of obstruction of uneven calibre, and for this reason suture was often conducted around a tube the removal of which was again difficult. Further leakage was not uncommon and stenosis was likely to occur; the latter had occurred in a mild degree in Mr. Walton's one case of the kind.

2. *Lateral Choledochoenterostomy* might be performed in those cases where the obstruction was low down and the duct considerably dilated, the duct being anastomosed to the duodenum. The main indication for this operation was the rare condition of congenital cystic dilatation of the common duct; it might also be performed in cases of obstruction from pancreatitis or carcinoma of the pancreas where the gall-bladder was not available for cholecystenterostomy owing to disease or its previous removal. The operation was not a very satisfactory one; it caused angulation of the duct with stress on the suture line, and the opening, being large, involved a risk of the passage of duodenal contents into the duct with the consequent risk of infection of the latter.

3. *Reformation of the Common Duct* was called for when considerable segments of the duct had been excised for a growth or fibrous stricture, or for fistula resulting from surgical injury unrecognised at the time. In the latter cases the structures were much obscured by inflammatory changes, and the lower part of the duct was often practically obliterated. Attempt

had been made to form a new duct from an autogenous graft of fascia later, but these operations were difficult and a portion of the graft was likely to fail. Practically every case could be treated by either direct or indirect implantation of the upper end of the duct into the duodenum.

(*a*) *Direct Implantation*, first performed by Dr. Mayo wherever possible was the operation of choice; the upper end of the duct was brought down and anastomosed to an artificial opening in the duodenum. The opening must be so devised as to be valvular; this was accomplished in Mayo's operation by making a somewhat circular incision in the duodenum thus producing a flap-like formation, and in other cases by burying the duct obliquely in the duodenal wall for some distance. Such operations were naturally only available when the duodenum was mobile—that is, when the operation was a primary one. It would appear to be essential that the opening should be valvular to prevent an ascending cholangitis. When the duodenum was not sufficiently mobile a loop of jejunum brought through the transverse mesocolon might be employed, but such a loop was unsatisfactory by causing traction upon the anastomosis.

(*b*) *Indirect Implantation.* — Sullivan's original method was to wrap omentum round a rubber tube implanted into the duodenum at one end and into the duct at the other, in the hope that a fistulous track would be produced and the tube passed later. Such operations were often unsatisfactory. The tube, failing to be passed, might become encrusted with calculous deposit, or the fistulous track might become stenosed after the tube had been passed. These drawbacks were now overcome by using a flap cut from the anterior surface of the duodenum in place of omentum. The technique of this operation, which was described in considerable detail, was comparatively simple, and the operation was available even when large gaps had to be bridged. The new duct was valvular and was lined with duodenal mucosa accustomed to the passage of bile. The rubber tube, which was held in place by only one plain catgut suture, was usually passed within a fortnight. The flap operation could by a simple modification be employed for those cases where the common duct was dilated from obstruction by chronic pancreatitis or carcinoma of the head of the pancreas, a lateral opening being made in the duct and anastomosed by means of the flap to the duodenum.

The PRESIDENT remarked briefly on the extreme importance of care and a knowledge of pathological anatomy in the operation of cholecystectomy or any other operation in this region.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

METASTATIC GONORRHŒA.

A MEETING of this Society was held at the rooms of the Medical Society of London on June 29th, Dr. F. N. KAY MENZIES occupying the chair.

The discussion on the metastatic results of venereal disease, reported in THE LANCET last week, was concluded, the subject being dealt with from the aspects of affections of the eye, the skin, the cardiovascular system, and the kidney.

Mr. SYDNEY H. BROWNING and Mr. BASIL LANG dealt with

Gonococcal Affections of the Eye.

Mr. BROWNING based his contribution on his experience at Moorfields Eye Hospital during the last 14 years. Ten years ago, he said, gonococcal ophthalmia in newly-born infants was very common; to-day it was very rare, a remarkably sudden decrease occurring when, in 1920, there was extra supervision of and greater care by midwives. Most of the infants so suffering nowadays had a chemical irritation due to over-zeal, and this might be a seat of secondary infection by various pathogenic germs, conveyed, probably, by the family handkerchief. An enormous advantage in culture of the gonococcus was obtained by using Dr. P. P. Laidlaw's method of diminished oxygen tension, which he described. Vaccines he had not found of material benefit in any way to children with gonorrhœal ophthalmia. Despite appearances, patients must not be considered cured until the conjunctivæ were proved bacteriologically to be free of gonococci. In adults gonorrhœal ophthalmia usually resulted from an existing acute or subacute urethritis. Here, vaccine therapy in many cases diminished the frequency of ulceration. The urethra must be treated at the same time; and if only one eye was involved, the other must be protected. He did not know of a case in an adult in which the gonococcus had been recovered from either gonorrhœal conjunctivitis or irido-cyclitis. Pus existed in the conjunctiva in these conditions, but it had not been shown to contain organisms. They were probably toxic. As gonorrhœal iritis was a late sequel of gonorrhœa, it was not usually seen at first hand by the V.D. specialist, and it was generally treated as a purely local infection. He did not think it was set up by the presence of the gonococcus in the eye. Still, there was good reason for believing that the origin was gonorrhœal, for there was usually a history of gonorrhœa, there was a specific reaction to gonococcal vaccines, and a recurrence of the iritis followed prostatic and vesicular massage. Incidentally, he mentioned that he had neither seen nor heard of a case of gonorrhœal iritis in the female. Immediate vaccine therapy was indicated in all cases of gonorrhœal iritis, and it should be pushed to the extent of securing a considerable reaction in the eye. Detoxicated vaccines had not yielded any results in his hands.

Mr. BASIL LANG said there were three types of metastatic infections of the eye from gonorrhœa: iritis, scleritis, and choroiditis. The first and second were uncommon from this cause, and choroiditis without scleritis quite rare. Usually a joint affection preceded any of the three. The distinguishing feature of this iritis from other forms was a clear gelatinous exudate into the anterior chamber, and the iritis was always associated with congestion of the ciliary vessels, and easily elicited tenderness over the ciliary region. The scleritis was acute in onset, and there was pain with chemosis. The choroiditis was also very sudden in onset, and the vitreous early contained many "floaters." With regard to treatment of the iritis, the pupil must be kept dilated at all costs. The atropine for this purpose was best used dissolved in castor oil, or made into an ointment with yellow vaseline. Cocaine, adrenalin, and leeches should be tried, as all blanched the eye. Leeches quickly reduced the pain. After these had been applied, the patient should bathe the eye with hot boric lotion. If heat did not benefit, cold compresses could be tried. He had never seen glaucoma produced by acute iritis. Gonorrhœal scleritis was treated on similar lines to the iritis. As to the general treatment, the patient was best in bed, and the bowels should be kept well open. Recurring iritis might be due not to the gonococcus but to a streptococcus. Sometimes an autogenous streptococcal vaccine caused a rapid cure.

Gonorrhœal Affections of the Skin.

Dr. H. G. ADAMSON dealt with the subject from the standpoint of skin diseases. He said gonococcal metastatic skin eruptions must be understood to mean eruptions produced by gonococci carried to the skin by the blood-stream. He questioned, however, the existence of such eruptions; dermatologists had little, if any, practical experience of them. The statement originated in monographs written by a German—Buschke, and a Frenchman—Perrin, in 1900, and had been copied into books ever since. Audrey, however, a careful French observer, published a case which deserved attention, in which erythematous patches following fever and joint pains showed points of suppuration, which coalesced into an abscess, and the pus from this contained gonococci in abundance. Audrey suggested that the gonococcus should be looked for in other cases of erythema multiforme. A different eruption, seen in association with gonorrhœal infection, was keratodermia blenorrhagica. This consisted of conical, horny, or translucent-looking elevations, varying in size from that of a pea to an inch across, situated chiefly on hands and feet; they might encircle the nails, and occur on the nail-beds, resulting in the nail being either raised or cast off. Sometimes a peculiar balanitis was also present. In most cases it accompanied severe gonorrhœal arthritis, with recent urethritis. Most of these cases recovered spontaneously in the course of several months by the separation and fall of the horny matter. In cases of undoubted keratodermia blenorrhagica frequently the patient was found to have also had psoriasis, or a psoriasiform eruption. The lesions of keratodermia blenorrhagica were really heaped-up masses which could be pulled off, leaving a smooth, glazed surface; the process was not really a hyperkeratosis, but a parakeratosis, like that in psoriasis. The question arose whether in keratodermia blenorrhagica one was not dealing with severe psoriasis in a patient predisposed to gonorrhœa. He quoted cases which seemed to bear out this view. Possibly psoriasis might be due to a microbe related to the gonococcus.

Gonorrhœa and the Cardiovascular System.

Dr. R. A. **ROWLANDS** dealt with the subject in its relation to the cardiovascular system. He said Lacassagne, in 1872, considered that cardiac complications were very rare in gonorrhœa; but the endocardium and pericardium were attacked, particularly the latter. In 1895 Thayer and Blumer proved the existence of a gonococcal septicæmia, as well as an ulcerative endocarditis, due to the gonococcus alone. In 31 per cent. of Thayer's cases there was arthritis during the course of the illness; and in a series culled from literature it was present in 68 per cent. The symptoms were those of septicæmia. There was headache, lassitude, pain in the loin, and when of sudden onset it was ushered in with a rigor. There was also irregularly remittent or intermittent fever, associated with rigors and sweating. There was in addition rapidly developing secondary anæmia, which became more marked with the longer duration. In all cases there was a very marked leucocytosis. In two-thirds of the cases there were embolic phenomena in the skin, kidney, spleen, brain, lungs, or skeletal muscles. Renal infarction was shown in ten cases by hæmaturia, and in two cases there was a partial hemiplegia. Cutaneous hæmorrhages were present in six out of 11 cases. Acute or subacute nephritis was found in most of the cases. The average duration of the disease was nine and a half weeks, and in four cases there was a terminal mixed infection. The anatomical lesions were those of vegetative or ulcerative endocarditis. Mural endocarditis was present in eight out of 20 cases, while in four cases acute pericarditis existed. Dr. Rowlands proceeded to describe a number of cases, and gave the post-mortem findings in one or two fatal cases. It was not the rule to examine the hearts of patients when they first came suffering from gonorrhœa. A previous rheumatic endocarditis did not predispose to gonococcal disease of the endocardium, for gonorrhœa was quite as liable to attack a healthy valve.

Mr. **KENNETH WALKER** spoke on the subject in relation to the kidney. He said the gonococcus might be present unsuspected in the epididymis until a blow, by lowering the vitality of the part, enabled the activity of the organism to be revealed. Sometimes a pathologist would fail to find it on two occasions and succeed on a third, which would seem to show that the discharge of the organisms into the general circulation took place at odd times, the flooding of the blood-stream coinciding with rises of temperature. He believed the commonest portal of entry of the organisms into the blood-stream was the prostate. Gonococcal pyæmia showed a mortality, according to French authorities, of about 30 per cent. Apparently the vascular lesion was the fatal one. Considering how common was gonococcal infection of the lower urinary tract, it was surprising how seldom the kidneys were attacked. In many cases of so-called gonococcal pyelitis the trouble was found to be due to secondary organisms. Semens, in a search of the literature, was able to find only 25 cases of undoubted gonococcal infections of the kidney, and of these only 15 were purely gonococcal. A few of them seemed to be cases of an ascending infection. Gonococcal bacteriæmia seemed to be of fairly frequent occurrence. The most fatal lesion of gonococcal pyæmia was endocarditis.

Major A. T. **FROST** thought it likely that the reason very few cases of metastatic complications of gonorrhœa were seen in army practice was that special attention was paid to the prostate gland; every case was thoroughly examined, and the gland massaged; and the man was not allowed to leave the hospital until, by all the known tests, the prostate was normal. He had seen very successful results of treating keratodermia blenorrhagica by means of vaccines. That seemed to show that it was a toxæmia, especially as in that disease no one had found the organism under the skin. At Rochester Row the same good results as Mr. Browning's had not been experienced by the use of low oxygen tension. The governing factor seemed to be the hydrogen-ion concentration.

Dr. T. **ANWYL-DAVIES** spoke of a case in which, four days after marriage, the gonococcus was grown in pure culture from the cervix, which showed no sign of inflammation. The husband had acquired gonorrhœa six weeks previously. The woman attended because of an ankle lesion, which was almost suppurating. The condition cleared up under a course of vaccines. In another case repeated tests of the urethra and cervix failed to reveal gonococci in the pus, but after treatment had continued a month there was arthritis of the elbow. This was punctured, and pure gonococcus was obtained. The case cleared up with plugging and catheterisation of the uterus, and the use of vaccines.

Mr. **SYDNEY MACDONALD** said he regarded the vesicle as the chief port of entry of the gonococcus to the general system. Excising the vesicle seemed to be the only means of cutting off the source of infection; he did not think it could be drained. Sometimes sufferers from joint affections were found to have had gonorrhœa ten to 25 years previously.

MESSRS. Cassell and Co., Ltd., announce the forthcoming publication of the second (revised) edition of Choyce's System of Surgery.

THE University of London Press announce the forthcoming publication of the following: "Diseases of the Breast," by Mr. Willmott H. Evans; "Daydreams; a Study in Development," by Mr. G. H. Green, B.Sc.; "The Young Delinquent," the first of three volumes on the Sub-Normal School Child, by Dr. Cyril Burt; and "Talks on Psychotherapy," being the course of lectures recently delivered at King's College, University of London, by Dr. William Brown.

DONATIONS AND BEQUESTS.—The late Mr. Thomas Arnold Cash, of Highgate and Coventry, left by will, among other bequests, £2000 upon trust to enable his brother to carry on the work for the promotion of the Humane Slaughtering of Animals, £1000 to the Model Abattoir Society, £1000 to the Coventry Society for the Prevention of Cruelty to Animals, for investment for the maintenance of a whole-time inspector for Coventry and the surrounding district; £1000 to the Coventry and North Warwickshire Hospital; and £1000 to the Birmingham Cripples' Union for the establishment or support of a branch in Coventry. On the death of his wife he left £5000 to the Corporation of the City of Coventry for a public abattoir and cattle market.—By the will of the late Mr. Johann August Diederich Bornemann, of Lincoln, the testator left among bequests £1000 to the Lincoln County Hospital and £100 to the Lincoln General Dispensary.

Reviews and Notices of Books.

A TEXT-BOOK OF PHARMACOLOGY AND THERAPEUTICS.

By E. POULSSON, Professor of Pharmacology in the University of Christiania. English edition, edited by W. E. DIXON, M.A., M.D., F.R.S., Reader in Pharmacology and Assessor to the Regius Professor of Physic, Cambridge. London: William Heinemann (Medical Books), Ltd. 1923. With 31 illustrations. Pp. 519. 25*s.*

IN no branch of medical study is the text-book so important as in pharmacology, for it is this subject which receives the least attention in the race to cover the fields of all the medical sciences, and the lecturer's opportunities of interesting the student in it are few. Writers of pharmacological works have perhaps the most fascinating of all material at their disposal, but the text-book worthy of pharmacology is yet to be produced. It will not be content to assume the form of a work of reference which only those already well grounded in physiology and pathology can usefully read, but it will give an account of the physiological and pathological processes occurring in the different systems, and then discuss the modification of function by pharmacological means. Such a book, carefully written, might be lengthy, but it would be of very great interest to the student, and of enormous value in inculcating a scientific method of approach towards all medical problems.

The scope of the standard text-books of pharmacology in current use in this and other countries is much more limited. The plan usually adopted is to take each drug separately and detail its several actions, to provide, as it were, a catalogue without much cohesion. Prof. Poulsson has not departed from this general pattern, but within its limits his text-book is a very creditable production. Already well known on the continent, it makes its first appearance in English under the trustworthy editorship of Dr. W. E. Dixon. It is essentially a book for the medical student, condensing its matter to a point mid-way between the larger text-book of Cushny and the smaller manual by Dixon, and in general presentation of the subject having considerable resemblance to both. The translation has been well done, for the sentences always run smoothly, and a reasonable balance has been maintained between the size of the volume and the size of the type. The classification followed is that of Schmiedeberg, and the various agents are taken one by one in an order permitting of easy steps, their pharmacological and clinical effects being described. As is to be expected, much of the experimental groundwork done by English workers does not appear, but in the general conclusions about the manner in which different drugs act there is an astonishing measure of agreement with current English points of view. Mention is made of some of the newer therapeutic agents, such as sodium, potassium, bismuth tartrate for syphilis and insulin for diabetes; it is perhaps a pity that a fuller account of these is not given, and that there is no discussion of other new treatments, such as the use of quinidine in heart disease. It is indeed surprising to find the statement that of the 20 different cinchona alkaloids "only quinine is of any great medicinal importance," for the value of the others in the treatment of malaria is now well authenticated.

These are small points, however, and on the whole Prof. Poulsson's manual contains sound orthodox teaching, clearly set out, and should be greatly appreciated by students of medicine.

ANALYTICAL MICROSCOPY.

By T. E. WALLIS, B.Sc., F.I.C., Ph.C. London: E. Arnold. 1923. Pp. 149. 6*s.*

MR. T. E. Wallis's little handbook on Analytical Microscopy, although intended primarily for the analytical chemist and pharmacist, can be recommended for a place on the shelves of the medical microscopist. All too frequently he encounters in his preparations of pathological material foreign matters not easily recognisable as such. Unidentified structures of vegetable origin have before now figured as cancer parasites to the confusion of the weaker brethren. It is not too much to say that most of this nonsense would never have seen the light of day if the observers had even glanced through the extremely serviceable and well-chosen illustrations of this book. The essential addition of the magnification of every figure, which is a welcome and valuable feature, is too seldom carried out by other writers on the microscope. The directions for working methods are clear and crisp and many have a wider application than is modestly claimed for them in the preface.

HOW WE RESIST DISEASE.

An Introduction to Immunity. By JEAN BROADHURST, Ph.D., Assistant Professor of Biology, Teacher's College, Columbia University. London and Philadelphia: J. B. Lippincott Company. 1923. With 138 text figures and 4 coloured plates. Pp. 248. 10*s.* 6*d.*

THIS cheerful book is one of the publisher's series of nursing manuals. It is meant as a short introduction to immunity for those who already have some acquaintance with systematic bacteriology and is designed primarily for nurses and general science students whose course cannot include anything like the full instruction given to medical students. It is well and clearly written, abundantly illustrated, and remarkably cheap. In a short compass it gives a great deal of information, and any nurse or layman who was tolerably well acquainted with its contents would be able to talk about immunity with some facility. But whether they would know much about it is another matter. The book is quite a brilliant attempt to make the royal road. It may seem to have succeeded. But, of course, it really fails, and to pretend to any university student that he can know about immunity without sweat and tears is to cheat him of his education. As to nurses, the days are no doubt gone when Florence Nightingale said, "the strongest to the wash-tub," and if they really know all there is to be known about bed-comfort and all the arts of sympathetic kindness which have saved more lives than antisera, they will no doubt be the better for reading Dr. Broadhurst as an optional graduate course reserved for those who have learned their business. It is a book for some sisters, not for all probationers. The senior medical student who knows his Muir and Ritchie might read it with advantage; many of the points are put very well and some of the diagrams are excellent. And it can be heartily commended to practitioners who have got out of touch with modern practical serology. But as a student's manual it will not do; one might as well propose to substitute Sir Oliver Lodge's "Easy Mathematics" for Pendlebury, or Hall and Knight.

ANORMALE KINDER.

By Dr. L. SCHOLZ, Nervenarzt in Bremen. Third revised edition by Prof. Dr. ADALBERT GREGOR, Direktor der Fürsorge-erziehungsanstalt Flehingen in Baden. Berlin: S. Karger. 1922. Pp. 312. M.30.

WE reviewed the first edition of this book in 1912. Dr. Scholz fell in the war and another hand has revised and enlarged the monograph, notably in the direction of amplifying the sections on after-care and social service. According to the author, of every 200 German children three are feeble-minded, which gives a total of about 180,000 for the 12 millions of children of school age. Figures quoted from Switzerland give a percentage of 1·6, which is approximately the same. The handling of such numbers, medically and educationally, is a task calling for a body of helpers in numbers far beyond those already enlisted, and for adequate assistance from the State. A full description is furnished of the methods in vogue in institutions, families and special schools. As far as we are aware, Dr. Scholz's work has not appeared in English, yet it contains much which should appeal to a wider public.

Specific Reflexes.

Untersuchungen über die Eigenreflexe (Sehnenreflexe) menschlicher Muskeln. By PAUL HOFFMANN, Privatdocent für Physiologie in Wurzburg. Berlin: Julius Springer. 1922. With 38 illustrations. Pp. 106. 6s.

THIS little book contains in small compass much physiological information the clinical bearing of which must be of particular interest to the neurologist, who deals with reflexes daily. Dr. Hoffmann considers, justly, that the term tendon-reflex is misleading, and he prefers to substitute for it the expression "specific reflex," meaning thereby that each muscle of the body (this can obviously be demonstrated more easily in some than in others) has its own reflex—i.e., makes its response to the adequate stimulus. It is unnecessary for the clinician to load text-books with tables of reflexes; he need only select one or two as of practical value. All skeletal muscles have this property in common, that if their extent is abruptly lengthened by any mechanical device they respond, provided the tonus is sufficient, by a contraction, which is not a movement, but a necessary, partial, function of all voluntary movements. Its isolated appearance, as in reflex-testing, is meaningless, or, rather objectless. The specific nature of the reaction is fully investigated by Dr. Hoffmann mainly with the help of the newer methods such as the Einthoven galvanometer, and the phenomena of facilitation and inhibition are minutely described.

The Emotions.

By CARL GEORG LANGE (1834–1900), University of Copenhagen, and WILLIAM JAMES (1842–1910), Harvard University. Psychology Classics: a Series of Reprints and Translations. Edited by KNIGHT DUNLAP, Johns Hopkins University. Vol. I. Baltimore: Williams and Wilkins Company. 1922. Pp. 135. $4.

Dr. Knight Dunlap has undertaken a commendable task in editing a series of reprints and new translations of psychological classics, and the first volume will undoubtedly lay the student of psychology, philosophy, or physiology under a debt of obligation to him. It contains (1) a new version from the German text of Prof. Carl Lange's book "Ueber Gemuthsbewegungen" (1885), and (2) a reprint of Prof. James's article in *Mind* (1884), entitled "What is an Emotion?" together with the chapter on the emotions from his "Principles of Psychology." In the history of the subject the James–Lange theory has exercised a profound influence on contemporary and later workers, and while it may be that the hypothesis stands in need of revision, or of "softening," as the editor says, at any rate it should be fully understood by those who are inclined to discard it. All who are interested should make themselves familiar with the originals as now first presented in convenient and consecutive fashion.

Der Balken.

Eine Anatomische, Physiopathologische, und Klinische Studie. By Dr. G. MINGAZZINI, Professor of Nervous Disease in the Royal University of Rome. Berlin: Julius Springer. 1922. With 84 illustrations. Pp. 212.

Prof. Mingazzini's monograph on the corpus callosum provides a remarkably complete account, anatomical, pathological, and clinical, of the largest commissure in the brain, and embodies much valuable information gleaned from various papers scattered through the literature and not readily accessible to the student. Within recent years attention has been directed to the corpus callosum mainly from the point of view of transcortical disorders of function, such as apraxia and agnosia, and approximate localisation within it has been rendered possible by the labours of many neuropathologists. The experimentalist, also, has worked at its physiology. The monograph under review should at once find its place in the library of every neurologist, since no text-book deals with its subject-matter so adequately, nor has any previous similar contribution been so detailed or so informative.

A Compendium of Tuberculosis Therapy.

Handbuch der gesamten Tuberkulose-Therapie. Edited by Prof. Dr. med. ERNST LOEWENSTEIN. Vienna: Urban and Schwarzenberg. 1923. In two volumes. With 32 illustrations, some coloured. Pp. 1044.

THE first part of this bulky handbook is published in two volumes, and if the second part is as bulky as the first, it would be more accurate to describe this work as a library than as a handbook. In his foreword, printed at the end of these volumes, Prof. Loewenstein states that this work is the sequel to post-graduate courses given by himself—courses which whetted the appetite of his pupils for a systematic course of published lectures by well-known authorities. The work is addressed to general practitioners, whom Prof. Loewenstein would like to see converted wholesale into tuberculosis specialists. Only thus can the campaign against tuberculosis become effective; hospitals and sanatoriums are but stations on the consumptive's long journey, and he will fare well or ill according as the long distances between these rare stations are patrolled efficiently by the general practitioner. It is customary to speak of him as the "busy" general practitioner. The many to whom this adjective applies may be more than a little alarmed by these 1044 pages, with the promise of more to come. Fortunately the subject is well classified, and thus the first qualification of a useful work of reference is guaranteed.

The editor of a work like this, to which many specialists contribute, should be a good team-driver, with a discriminating sense of proportion and balance. In this connexion it is a pity that one of Prof. Loewenstein's team of 20 has got out of hand. Nearly half of this first volume (469 pages, to be exact) is devoted to diet in tuberculosis, and it is doubtful if even the general practitioner who is not busy will find time to digest this monograph. The other contributors have kept their contributions within more modest limits, and the value of their work has certainly not suffered from their parsimony of words. Naturally many of the authors hail from Vienna, but the general editor has given a cosmopolitan flavour to his work by the inclusion of contributors from Barcelona, Philadelphia, Berlin, and Göttingen. Though the work is mainly concerned with treatment, there is plenty of pathology and even pure physics, and the chapter on the physical, chemical, and biological foundations of treatment by radiation is highly technical. There is a dry, but instructive, chapter on the statistics of tuberculosis by Prof. L. Teleky, of Düsseldorf, and a long and interesting chapter is contributed by Prof. G. Liebermeister on tuberculosis of the blood-vessels. A chapter with the intriguing title, "Statistics of Sanatorium Results," must bring disappointment to the statistician, for analysis shows that the statistical support of this form of treatment is very unreliable. The author concludes that a better estimate of the value of this treatment can be formed by the clinical study, by an expert, of a large number of cases. Another chapter is devoted to tuberculosis in relation to pregnancy, and the author, Dr. Frischbier, is in favour of inducing abortion when pulmonary disease is progressive. But he is not reckless in this direction, and he gives the very useful advice that the pregnant patient should be kept under observation for a month in a sanatorium before the fate of the fœtus is settled. In favour of inducing abortion he points out that the infant mortality in this class of case is about 70 per cent., and that inducing abortion has a favourable effect on the patient in about the same percentage. The chapter on respiratory exercises in pulmonary tuberculosis will give pause to readers who regard such exercises as the most effective method of inducing auto-inoculation.

In spite of the intrinsic merit of many of the chapters it is an open question whether such a large work, addressed to the general practitioner, does not defeat its own object.

ALFRED YARROW: HIS LIFE AND WORK.

By ELEANOR C. BARNES (Lady Yarrow). London: Edward Arnold and Co. 1923. Pp. 328. 10s. 6d.

ONE of the seven wise men of Greece—namely, Solon—was of opinion that no man should be called happy while yet alive, for life is full of uncertainties. If, however, any man can be called happy while alive it is the subject of this memoir, for it is the story of a man who from small beginnings has built up a great business, has done nothing but good work, has won the affection of all who worked with him in whatever capacity, has rendered incalculable services to his country, and has accumulated a large fortune. This last item he would consider as the least of his benefits except in so far as it has enabled him to benefit his fellows in many ways, and in two particularly—namely, the Yarrow Convalescent Home for Children at Broadstairs and the gift of £25,000 towards the new out-patient room at the London Hospital. Sir Alfred Yarrow has reached his eighty-first year, and it must be with great content that he looks back over his past years. We congratulate Lady Yarrow upon her book, so simply and clearly written, giving a life-like picture of a man who was never satisfied in turning out any work but the best. How good the best was may be gathered from the records of the Yarrow destroyers during the war and also of the various classes of boats employed on the Tigris. As regards the latter operations Lady Yarrow records one delightful episode. The boats had been shipped in pieces and had to be assembled at Abadan. Mr. William Grant was in charge of the work and had to obtain workmen from all parts of the country, and consequently of varying nationalities, races, and creeds. He found that if a foreman wanted a tool, such as a hammer, he had to send two men for it, for if only one were sent "and if he were seized with a sudden desire to pray (falling on the ground for that purpose, in which devout occupation he must not be disturbed) the hammer might not appear for a considerable length of time." The British plumber is not, we imagine, hindered in getting tools which he has forgotten by "a sudden desire to pray," but it is a mark of the brotherhood of man that the same characteristics appear in the East as in the West. In relation to this matter, we may refer readers to Chapter XXX., which contains Yarrow's views on industrial problems, and is full of sound commonsense.

And here we must leave this fascinating book, but we cannot do so without wishing both its subject and its author many more years of useful happy life. Everyone will recollect the story of the Greek voter who voted against another citizen because he was tired of hearing him called "the Just." So as to spare Sir Alfred Yarrow from this fate we must recall one blot in his life's work, and that is, that so far as we can gather, he was the first to introduce steam launches on the upper Thames—a subject upon which the language of Eton and Oxford is comparable to that of the English army in Flanders in the eighteenth century. We will only add that this book ought to be in the hands of every boy, not only those who are going to be engineers, for it is a handbook to patience, perseverance, honest output, and how to spend money when it has been made.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XX. April–June.—Mr. T. B. Layton contributes a paper on the Treatment of Acute Otitis Media in Children, in which he points out that this treatment is one which should be carried out in nearly every case by the general practitioner. The patient should be kept at rest in bed, while local treatment consists in the incision of the drumhead at the right moment. Mr. Layton maintains that it should be the aim of every practitioner never to allow a drumhead to rupture spontaneously, to look upon an inflamed ear, which under his observation has gone on untouched to the stage of discharge, as something of a disgrace to himself, just as he would consider to be so a case of acute appendicitis which in similar circumstances had gone on to acute peritonitis. As it is important that nothing should prevent a good view of the drumhead being obtained, hot fomentations, which cause the superficial epithelium to swell up and entangle any bits of cerumen, should never be used, but pain should be relieved by application of dry heat to the ear and side of the head by a hot-water bottle and pad of wool, and by the installation of antiseptic drops. The drumhead should be incised as soon as it is seen to be bulged, the incision being made deliberately under an anæsthetic. In the subsequent treatment of the case the practitioner must watch carefully for signs of mastoiditis.—Dr. F. Parkes Weber contributes a paper entitled The Nature of Banti's Disease: Its Differentiation from Other Types of Splenomegaly and its Relation to "Idiopathic" Non-Alcoholic Progressive Hepatic Cirrhosis in Children and Young Persons.—In a paper on the Classification of Blood Diseases in Childhood, Dr. Gordon Ward has drawn up a new classification founded on a mixed anatomical and pathological basis. —Dr. R. Miller reports a case of cœliac disease showing symptoms of megacolon, with autopsy, his object being, first, to establish that cœliac disease may give rise to distension of the colon sufficient to cause visible colonic peristalsis, and, secondly, to confirm his view that cœliac disease is a digestive fault, and not an organic disease.—In a paper entitled On Localised Peritonitis Due to Intestinal Perforation in Paratyphoid Fever: Report of a Case, Mr. A. E. Mortimer Woolf states that perforation in paratyphoid fever is uncommon in civil practice, though during the war hæmorrhage and perforation were almost as frequent in paratyphoid as in typhoid. When perforation occurs in typhoid or paratyphoid, general peritonitis nearly always takes place. Although there are a few instances on record of localised peritoneal abscess in typhoid fever, the writer has been unable to find any previous examples occurring in either paratyphoid A or B. The case here reported was in a boy, aged 15, who developed acute abdominal pain on the fifteenth day of an attack of paratyphoid B. At operation a perforation was found in the lower end of the ileum walled off from the general peritoneal cavity by the great omentum. The perforation was closed, and recovery was uneventful.—In a paper on the Meningeal Form of Typhus in Children, MM. Gratzosky, Stroë, and Coccias, of Bucharest, remark that typhus in children occasionally assumes a meningeal form, of which they report three examples in patients aged 2, 3, and 7 years respectively. The meningeal symptoms consisted in strabismus, inequality of the pupils, nuchal rigidity, exaggerated reflexes, and positive Kernig and Brudzinski signs. On lumbar puncture a clear cerebro-spinal fluid was obtained under hypertension, containing abundant lymphocytes with a few red cells and polymorphonuclear leucocytes. One case was fatal, and the autopsy showed meningeal infiltration and a large quantity of cerebro-spinal fluid slightly blood-stained in character. The other two children recovered in nine and ten days respectively.—The abstracts from current literature are devoted to alimentary diseases and oto-rhino-laryngology.

THE LANCET.

LONDON: SATURDAY, JULY 7, 1923.

HOUSE INFECTION.

MUCH interest has been excited by the publication of Mr. Justice McCARDIE's reserved judgment in the case of COLLINS *v.* HOPKINS, the details of which are summarised on p. 34. His Lordship ruled that it was the obvious duty of a person, in whose house there has been recent infectious disease, to disinfect it in the most complete manner open to him, before letting it furnished. In his reading of the law a warranty is implied in any contract on the lessor's part that the premises are reasonably fit for habitation, including freedom from the risk of infectious disease, irrespective of whether the subject was mentioned between him and his prospective tenant or not. The law does not lay upon the lessor the obligation to consider the fads of nervous persons unreasonably afraid of infection where no danger exists. Nevertheless, if the lessor wishes to avoid trouble, he will be frank in mentioning any disease likely to cause alarm, and in giving full information as to the steps he has taken to remove any source of infection. We do not propose to comment in detail upon the many divergences in statement and in opinion which arose in the hearing of this very important case. Mr. Justice McCARDIE accepted as a fact that the house was left in a dirty condition, and his judgment was definitely based upon this premiss. Of course, if the house was dirty all the rest follows, for domestic dirt affords a nidus for the development of bacteria of all kinds, and no one should hand on the tenancy of dirty dwelling-rooms. We have a feeling that more might have been made by the defence of the preparations actually made for the tenant's incoming. There were no hangings but casement curtains, and these were washed; a solution of lysol was used for washing the floors; bed-clothes were sent to the laundry as well as the loose covers of furniture, and new covers were made for the cushions. But over and above this, there was the assurance on the part of the medical attendants that the case was not one with pronounced symptoms of advanced disease and that, although tubercle bacilli were present in the expectoration, the patient was sanatorium-trained, and meticulously careful in observing the instructions he received to prevent the spread of infection. The omission of notification to the local medical officer of health was indeed an unfortunate oversight, but the omission to fumigate the premises, we understand, was deliberate, in view of the care taken by the patient, and in view of the fact that he spent his time on the balcony and not in the rooms.

But although in this particular instance, and for the reasons stated, the case went against the defendant, that part of His Lordship's judgment which merits the closest attention is his statement that if the patient were properly trained as to his habits, if he carried out his medical instructions, and if full regard was paid to ventilation, sunlight, cleanliness, removal of dust and dirt, and the like, then the risk of infection might not be serious even to those who resided with him. Still less was the risk, he went on, to those who entered the house after the patient had left and if proper methods of disinfection had been adopted. We are grateful to the learned judge for thus setting out clearly the essential factors in the conveyance of infectious disease from one person to another. Only in regard to terminal disinfection would the modern hygienist place the emphasis differently. At a recent congress of the Royal Sanitary Institute, Dr. T. W. NAYLOR BARLOW, the President-elect of the Society of Medical Officers of Health, traversed the whole notion of the potency of present methods; he went so far as to say that all house disinfection might safely be scrapped. Without denying the possibility of transmitting disease by means of inanimate objects, he regarded books, the walls of rooms, and such like, as of no account as factors in the spread of disease, logically adding that the so-called disinfection of rooms by gas is futile and unscientific. Conviction is indeed growing, not in this country alone, that the living breathing human being is the only real danger. We recently quoted the decree of the Prussian Ministry of Health, the essence of which is to organise bedside disinfection during the whole course of a patient's illness in such a way as to make a final disinfection of secondary importance or, indeed, altogether superfluous. It is perpetuation of the chronic carrier to which professional and public attention alike should be directed, and, while gaseous disinfection by formalin and sulphur fumigations may be done, this sanitary ritual should not lead to neglect of the weightier matters of the law of personal hygiene, soap and elbow-grease, sunshine and ventilation.

THE SMALL-POX MENACE.

THE Minister of Health, in his opening statement in Committee on Supply in the House of Commons on June 28th, alluded to the present situation in regard to small-pox as distinctly serious, and regarded it as his duty to speak plainly. Whereas 20 years ago 75 per cent. of young children were vaccinated, to-day the percentage was only 38, and the country was faced with the possibility of the outbreak of a great epidemic which would be dangerous to health and even perhaps to life, besides inflicting injury upon the commerce of the country. The Ministry, he said, was watching the situation closely, and he emphasised as strongly as he could that the one sure protection against small-pox was vaccination, and that those who refused, or incited others to refuse it, were taking upon themselves a very grave responsibility. Up to June 16th 955 cases of small-pox had been brought to his notice, a number nearly as great as the total notifications of last year. Among those who had had experience of the actual disease, there had, he thought, been no doubt as to the nature of the recent cases. Although mild, the fact must not be lost sight of that the disease, which began in a mild form, might presently develop into something very much more serious. Mr. NEVILLE CHAMBERLAIN's words may be read in our Parliamentary Intelligence column.

The situation in Gloucester is reminiscent of the early days of public health administration, before there was a general recognition on the part of the community that health was a first charge on their time and interest, a basis on which alone the fabric of civilised life could be firmly built. Something has occurred in Gloucester to interrupt the orderly course of notification, isolation, and protection of contacts which has become the token of enlightened municipal action throughout most civilised countries. Expression has been given with more or less emphasis to three different shades of thought. Some of those prominent in civic life have held that, whatever the nature of the infectious exanthem prevalent in the town, nothing should be done about it in a public way, in order not to spoil the trading facilities and other amenities of the place—a natural but not very long-sighted form of local patriotism. Another section has regarded the diagnosis of chicken-pox almost in the nature of an article of faith not amenable to disproof by ordinary scientific criteria; for a considerable number of cases notified as chicken-pox, actually 31 in the week ending June 23rd, have been rediagnosed as small-pox by medical officers of the Ministry of Health and of the Metropolitan Asylums Board, whose knowledge as experts would receive immediate acceptance in a calm atmosphere. Difficulty seems to have arisen in regard to the distinction between chicken-pox and small-pox, largely owing to insufficient stress being laid on the distribution and simultaneous appearance of the rash and too much importance on the presence of constitutional symptoms; for, as we have already noted, and are glad still to be able to note, there has, so far, not been a single fatal case this year among all the notified cases of small-pox. This admirable mildness of the disease it is which has encouraged still another local view—namely, that the disease is small-pox, but that it does not matter, the mildness being such as to render the outbreak unimportant from a public health point of view, making it therefore unnecessary to impose limitations on personal liberty in connexion with it. We are glad to think that there is no body of medical opinion included in the first and third groups which we have mentioned, and that the doubt in regard to the diagnosis is honest doubt, bred of the lack of experience in seeing actual cases of small-pox, which is the heritage of the last two generations of medical men. Dr. W. McC. WANKLYN spoke very appropriately to Guy's medical students last week on this alleged inability of the medical profession to diagnose small-pox, and he laid before them the results of the consultative system of small-pox diagnosis in London and some solid proof of what this system of diagnosis has effected. It is something for which humanity may be thankful that one of the worst of infectious plagues betrays itself early by a characteristic skin eruption which it is not—to use the phrasing of the National Health Insurance Act—beyond the ability of the practitioner of ordinary competence and skill to discover.

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THE NATIONAL PHYSICAL LABORATORY.

AT the invitation of the President of the Royal Society a large company gathered at Teddington last week to view the various departments of the National Physical Laboratory. The opportunity of seeing the research and testing departments in full working order and of meeting experts in every branch of physical science, which the occasion afforded, was widely appreciated, and the spacious department of aero-dynamics, with its huge wind tunnels, formed a pleasant setting for the reception.

Among the many branches of science flourishing at the laboratory there is, perhaps, none so interesting from the medical point of view as that of radiology. The recommendations of the X Ray and Radium Protection Committee for the better protection and general improvement of the working conditions of X ray operators have resulted in a large number of X ray materials being submitted for test to this department. A report of the work has been made by Dr. G. W. C. KAYE and Dr. E. A. OWEN. It contains interesting data concerning the protection afforded by such substances as sheet lead, lead-impregnated rubber, lead glass, and barium-sulphate plasters. The lead equivalent—that is, the thickness of lead equivalent in absorption power to unit thickness of the material—has been determined, and the figures given in the report will be of great convenience to radiologists. Of the many interesting comparisons given the following may be cited. The lead equivalent of a 12-in. solid concrete floor is about 3 mm. The masses of a steel and a lead plate which afford equal protection against X rays excited by 100,000 volts are in the ratio of 4 to 1. Different makes of lead rubber are found to differ by as much as 100 per cent. in protective value. Among the substances used for tube boxes sheet lead appears to be the lightest protective material to use, lead rubber being anything from 5 to 25 per cent. heavier. The open lead glass bowl, commonly used with X ray tubes, is criticised by the authors, who state: "In our experience, where this type of shield is alone employed, it is often possible to take a radiograph in any part of a room where a tube is working." Concurrently with this research on X ray protection the department has carried out investigations on the intensity of X rays emitted by Coolidge and gas tubes when operated by various types of high-tension generator. The work has shown that the intensity of the radiation emitted by an X ray tube is not in all cases proportional to the mean current passing through the tube, when the applied voltage is kept constant. Further, the investigators are led to state that: "Considerations of voltage and current wave-forms point to the conclusion that for a given voltage, and when the maximum current is in phase with the maximum voltage, the intensity of radiation emitted by an X ray tube, whether of the gas or of the hot cathode type, is roughly proportional to the maximum or peak current passing through the tube. This is true both for coil and transformer discharges." The radiology department is fully alive to the increasing application of higher voltages in medicine and in the study of metallic structures, as is shown by recent acquisition of a 200 kilo volt machine. Doubtless many of the problems involved in the practice of deep therapy will receive due attention at the hands of the director and his assistants. The department of sound is growing, and among the exhibits many were of medical interest—in particular an apparatus for the production of sounds of constant intensity and telephonic methods for the measurement of sound intensity. Certain workers in this field claim that variations of intensity of one million fold can be detected by the ear, and further by the use of these methods it can be demonstrated that the ear is incapable of detecting a 10 per cent. change in the intensity of sound. The research in this direction contemplated by the department will be awaited with interest, and might eventually be applicable to stethoscopy. In the multitude of routine tests which are carried out in the various sections there is evidence in all directions of the ingenuity and thought expended on the minutest details of even the simplest physical determinations. For example, in tests made upon the clinical thermometer, despite the fact that less than 2 per cent. of the number received are rejected, each thermometer is tested at four different temperatures between 95° and 110° F., its readings at these points being compared with a standard thermometer. The comparison is carried out in an electrically heated water thermostat, in which the water is kept in very rapid circulation. After the comparison has been made for any one temperature, the water is raised in temperature a further two-tenths of a degree, and readings of the thermometers are again taken to ensure that they are responsive to slight temperature changes. At the present time about 1200 thermometers are tested daily in this manner.

Many fascinating exhibits were displayed by the optics division. The colour effects obtained with the Nutting colorimeter were as pleasing as the methods for measuring the radii of curvature of microscope objectives were ingenious. The polarimetric and saccharimetric equipment, together with the apparatus for lens testing, was particularly attractive. Though in three fascinating hours only a small part of the activities of the laboratory could be witnessed, it was possible to estimate the magnitude of the work efficiently dealt with. In the National Physical Laboratory the nation has an asset of incalculable value.

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A SPA FOR THE T.B.M.

HARROGATE is making a push to become the place of healthy resort for the tired business man, that ill-defined but frequent product of our present-day city life. With its pleasant subalpine situation and its abundant facilities for the application of the healing virtues of waters and sunshine and fresh air, it is not unreasonable to suppose that the early stages of this real and destructive fatigue may be treated with success. Common experience, indeed, points in this direction, and medicine is primarily concerned with selecting the appropriate cases and eliminating those in which there is already the foundation of serious organic disease. For this Harrogate is well equipped, for it has clinical facilities which can easily be turned into team-work and pathological facilities to detect the early stages of organic malady during a period of time devoted to rest and recreation. Nor does Harrogate cater only for those of abundant means, for, through the Royal Bath Hospital, which has a considerable endowment and is largely supported by the more wealthy visitors, pass every year 2000 or more patients from all parts of England, and arrangements have been made by the local medical profession for the complete examination of cases of moderate means at an inclusive fee. A new Pullman car service has been inaugurated bringing the bracing northern spa within easy reach of comfortable travel from London and, contrary to foreign practice, two-thirds of the train is put at the disposal of modest purses.

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INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

SMALL-POX IN ENGLAND AND WALES.—During the week ending June 23rd 141 cases of small-pox were notified in England and Wales, the distribution being as follows: Derbyshire 12 (Alfreton 1, Belper 1, Heanor 4, Long Eaton 5, Clown R.D. 1): Durham 1 (Stockton-on-Tees); Gloucestershire 90 (Gloucester 79, including 31 cases notified as chicken-pox but rediagnosed as small-pox, Cheltenham 1, Stroud 2, Westbury-on-Severn 1, East Dean R.D. 4, Gloucester R.D. 3); Herefordshire 1 (Hereford): Nottinghamshire 21 (Kirkby-in-Ashfield 6, Warsop 15); Warwickshire 1 (Birmingham); Worcestershire 1 (Martley R.D.); Yorks North Riding 1 (Middlesbrough); Yorks West Riding 12 (Bentley-with-Arksay 2, Doncaster R.D. 10); Monmouthshire 1 (Risca).

Annotations.

"Ne quid nimis."

THE POSTPONED BIRTHDAY HONOURS.

LAST week-end was published the list of honours, conferred on the occasion of the King's birthday, announcement of which was postponed on account of the change in Prime Minister. A baronetcy has been conferred upon Sir Anthony Bowlby, K.C.B., K.C.M.G., K.C.V.O., President of the Royal College of Surgeons of England, and knighthoods upon Dr. George Francis Blacker, C.B.E., Dean of University College Hospital Medical School, and on Lieut.-Colonel Ewen John Maclean, chairman of the Consultative Council of the Welsh Board of Health. A Commandership of the Order of the British Empire has been conferred upon Lieut.-Colonel John Southey Bostock, R.A.M.C., Director of Medical Services of the Ministry of Pensions. To these gentlemen we offer hearty congratulations in the name of the medical profession. Other names in the list familiar to medicine are those of Sir William Plender, who has done excellent work in connexion with the National Health Insurance Act and who becomes a baronet, Mr. Walter Schroder, coroner for Central London, who becomes a Knight Commander of the British Empire, the Rev. Canon Frederick Charles Davies, vice-chairman of the Consultative Council of National Health Insurance, Mr. Walter Davies, chairman of the Manchester Hospitals Voluntary Committee, and Mr. Ernest Tom Neathercoat, President of the Pharmaceutical Society (for work in connexion with the Dangerous Drug Regulations), who become Commanders of the Order of the British Empire.

TUBERCULOSIS IN CHILDHOOD.

IN the July number of *Tubercle* there are several original articles and reviews dealing with tuberculosis in childhood. It has been said that if the problem of tuberculosis in childhood were solved, the problem of tuberculosis in the adult would practically cease to exist. In a paper by Dr. C. D. S. Agassiz and Dr. S. Roodhouse Gloyne an account is given of investigations undertaken with a view to determining whether or not the tubercle bacillus can be detected in the blood-stream in children at or about the time of the primary infection. In the cases chosen for this investigation the signs varied from those of slight involvement of the lymphatic glands to those of disease of the peritoneum or lungs. In the control cases the diagnosis of pulmonary tuberculosis was supported by extensive physical signs and the finding of tubercle bacilli in the sputum. From 1·5 to 10 c.cm. of blood were drawn from a vein, were mixed with a 1·5 per cent. solution of sodium citrate, and were in each case injected into two guinea-pigs. In no case did they develop tuberculosis, although blood obtained from these patients was drawn off both during apyrexial and pyrexial periods. It would thus appear that infection of the blood-stream by tubercle bacilli in children suffering from tuberculosis is not easily demonstrable by the method described, and the following alternative conclusions are drawn: That (*a*) the number of bacilli circulating in the blood is too small to be thus demonstrated, (*b*) they are discharged into the blood-stream only at intervals, or (*c*) extension of the disease takes place by some other route, such as the lymphatic system. A paper by Prof. P. Bull, of Christiania, contains a tale of an instructive mistake. A boy, aged 3, was supposed to be suffering from malignant disease of one testicle and metastases in the abdominal cavity. Laparotomy revealed no free peritoneal cavity; wherever he explored, Prof. Bull only found a curious greyish substance which seemed to have permeated the peritoneum, omentum, and neighbouring structures. Still thinking that the case was one of malignant disease, and therefore practically hopeless, he thrust radium tubes, without lead filters, into this greyish mass in various directions, the total dose of radium being 11 cgm. A week later the signs and symptoms of severe abdominal disease had vanished, and the child lived to die several months later of acute middle-ear disease. The necropsy showed extensive healing of tuberculosis in the peritoneal cavity and elsewhere. Among the reviews of original papers on tuberculosis in childhood there is one in which the value of a single Pirquet test is shown to be very untrustworthy. Of 800 children thus tested only 537 gave a positive reaction to the first Pirquet test with old tuberculin. Of the remaining 263 cases as many as 170, or 64·6 per cent., gave a positive tuberculin reaction either to a second Pirquet test or to the intracutaneous injection of old tuberculin in varying strengths.

FAITH AND PRACTICE.

IT is always rather difficult for a nonconformist of any complexion to understand the principles of the true faith, and when the *Homœopathic World* (No. 690, June, 1923) says that THE LANCET has "acknowledged the truth of the homœopathic principle," it is interesting to wonder to which or what principle assent has been given. Is it the original doctrine that *similia similibus curantur?* Or is it the more modern development which claims that drugs are effective in dilutions which would not contain a single molecule of the original active agent? Or is it the attribution of natures and qualities and emotions to plants which can be apprehended and used only by those in spiritual communion with the sources of drugs? It would be as difficult for the orthodox medical practitioner to draw up his creed of allopathy. Upon some of the clauses in both cases there would, we imagine, be insoluble differences of belief. But does this greatly matter when there is so much that is plain and fundamental from which no one will dissent? *In certis unitas, in dubiis libertas, in omnibus charitas.* No cult of medical men could have a better motto. And if it is followed in practice—and the more unconsciously the better—there is not much need to embark on the dangerous sea of putting down on paper what each group believes. They can all meet on the common ground of sincere humane and skilful work.

THE REGISTRATION OF DISEASE.

HOSPITAL statistics run largely to waste. This is, we think, the main lesson of a very interesting discussion on the Registration of Disease, opened by Dr. Reginald Dudfield at a meeting of the Royal Statistical Society last March,[1] and now reprinted. In his opening remarks at this discussion Dr. Dudfield pleaded for a utilisation of the records of sickness which accumulate in our general hospitals and other institutions for the treatment of disease. "It is a common experience," he said, "to read reports by different workers, dealing apparently with similar material, diametrically contradictory to each other." What is needed is the bringing together of the data derivable from all institutions, the collation and analysis of such data by a central body of statisticians who are not only statisticians but medical men of ripe judgment, well versed in the problems of public health. Other medical statisticians, Dr. T. H. C. Stevenson and Dr. Major Greenwood, and such eminent experts in public health matters as Sir William Hamer and Dr. John McVail, were in sympathy with Dr. Dudfield's general contentions. Dr. Stevenson pointed out that, even without drastic reform of the present system, some improvements might be effected. He instanced the emendation of the law required to secure knowledge of the sex and age distribution of cases of infectious disease, and suggested that a very good indication of the social class of each decedent would be afforded by a mere record of the number of rooms in the tenement occupied by the family. Dr. Greenwood dwelt upon the importance of a proper exploitation of hospital statistics, supplemented by a system of following up cases, in the study of the prognosis after operative or other treatment of malignant disease. Dr. Hamer advised Dr. Dudfield "in addition to trying to get more out of his Poor-law and health statistics" to try "to persuade the hospital authorities to introduce the study of disease as a mass phenomenon to their medical students." The medical profession as a whole will, we think, be in sympathy with Dr. Dudfield's ideas. Without doubt the economic and administrative difficulties of any centralisation of records are great, but the fact remains —and it is worth repeating and italicising—that, to a large extent, hospital experience *as a statistical datum* runs to waste. Of course, its value as such is only secondary, the highest use for hospital experience is its incorporation in the minds and practice of each generation of physicians and surgeons. But there is no opposition between these purposes. Sir William Osler could not be accused of having underrated the practical element in medical education, but, in his text-book, he employed the statistical method more fully and frequently than any other physician of his time. Dr. Dudfield's proposals would have had the full approval of that great physician.

A MILK-BORNE EPIDEMIC OF GASTRO-ENTERITIS.

A RECENT epidemic of milk-borne gastro-enteritis in Denmark has been the subject of instructive investigations by Dr. A. Christensen and Veterinary Surgeon P. Grinsted,[1] who claim that for the first time (with the possible exception of Dr. K. F. Meyer's case reported in the *Journal of Infectious Diseases* for 1916) proof positive has been found of a typical bovine paracoli infection being conveyed by cow's milk to man. The epidemic in question broke out on Oct. 11th, 1922, in a large hospital. Thirty-nine of the staff and 56 of the patients were seized with general malaise, fever, abdominal pain, nausea, headache, vomiting, and diarrhœa. In two cases there was an outbreak of herpes on the upper lip, and in one case there was partial loss of consciousness for 24 hours. None of the patients died, and no new cases occurred after the first outbreak. The incubation period was evidently very short, as was also the period during which the disease was contracted; for among the patients there was one who had been admitted to hospital for some other disease only the day before the outbreak occurred, and none of the persons admitted to hospital on the morning of the outbreak developed gastro-enteritis. All the patients had taken unboiled milk, and an inspection of the sources of the milk-supply led to the discovery that at a small farm one of the 13 cows in milk had fallen ill on Oct. 9th. Next day it had been very ill, with offensive diarrhœa and a temperature of 40° C. The cow died in the night of the 11th and 12th, but the milk yielded on the 9th had not been thrown away, although the cow's udder was œdematous. The necropsy on the cow showed definite signs of septicæmia, the spleen being gigantic and the liver and mucous lining of the small intestine showing acute inflammatory changes. Sections of the udder showed early mastitis which was evidently secondary to the enteritis and septicæmia. Numerous Gram-negative short bacilli, identified as bovine paracoli bacilli, were found in the spleen and secretion from the udder. A pure culture of the same bacilli was obtained from the fæces of two of the patients, and agglutination tests of the sera of 31 patients on the ninth to the twelfth day of the disease left little doubt as to the relation of the germs found in the cow to the epidemic in man. There is a disease in cattle, known in Denmark as "paracoli bacillosis," from which calves often suffer, but to which full-grown cattle are usually immune. It may be that this comparative immunity of full-grown cattle to paracoli bacilli explains the rarity with which human beings seem to contract this form of gastro-enteritis. But it is conceivable that this rarity is more apparent than real, and that were agglutination tests to be carried out more frequently in epidemics of this kind, bovine paracoli bacilli would often be convicted. The moral of this episode is not far to seek. Were farmers to be systematically taught the risks of keeping the milk of sick cattle, they would not be tempted to follow the penny-wise-pound-foolish policy of mixing infected with pure milk.

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[1] Jour. Roy. Stat. Soc., 1923, lxxxvi., 123.

[1] Hospitalstidende, April 11th and 18th, 1923.

A POST-GRADUATE COURSE ON ALPINE THERAPEUTICS.

WE have received the announcement of a course of vacation lectures on Tuberculosis in the Alpine Climate to be held at the Research Institute in Davos from the 19th to 26th of the coming August. This Institute, in regard to which we were able to give some preliminary details last autumn, has now materialised as far as its physiological section is concerned, under the management of Prof. A. Loewy, who was for long one of a group of collaborators with Prof. Zuntz in respiratory problems. The bacteriological section of the Institute is also ready for occupation, and it is hoped to place this in the charge of an expert, when the expected help from the Swiss Confederation comes in after the Tuberculosis Bill has become law. At present the joint sponsors of the Institute are the medical associations in Davos, Arosa, and the Grisons, the Swiss Association of Naturalists, the Swiss Red Cross, and the Swiss Association for Balneology and Climatology. The meteorological observatory, under the direction of Prof. C. Dorno, is in close association with the Institute, and it is therefore possible to study clinical problems from the varied standpoint of meteorology, physiology, and pathology. Voluntary studentships at the Institute will be open to a certain number of workers. The principal items of study during the vacation course will be the pathology of tuberculosis, modern views on immune biology, general and special diagnosis with exhibition of cases, X ray and laboratory demonstrations, pneumothorax and other surgical treatment of pulmonary disease, and the application of altitude treatment to diseases other than tuberculosis, such as asthma, diabetes, and malaria. Forenoons will be devoted to lectures and demonstrations, while afternoons will remain free for visits and excursions. The course is free, the lectures being delivered in French or German. Board and lodging is offered at an inclusive charge of 10 francs a day, to those attending the course. Further information will be given on application to the Scientific Research Institute, Davos, Switzerland.

THE AGENT PRODUCING SYMPTOMS IN EXOPHTHALMIC GOITRE.

THE symptoms of exophthalmic goitre are usually attributed to the presence in the blood of an abnormal amount of the active principle of the thyroid secretion —a supposition supported by the known fact that administration of an excessive amount of thyroid substance to normal individuals is followed by symptoms which are similar to those characterising this disease. In order to ascertain whether thyroid secretion circulating in the blood is the agent producing the characteristic symptoms, certain tests have been applied by Sir E. Sharpey-Schafer[1] to the blood of persons suffering from exophthalmic goitre and to that of normal individuals as controls. The "intestinal test" depends on the fact that the addition of a small amount of extract of thyroid to Ringer's fluid in which a strip of cat intestine is suspended causes an increase both in the rhythmic movements of the strip and in its tone. The test is not very delicate, nor indeed specific, since many other substances may produce a similar action. The serum of normal blood contains a substance which produces marked augmentation and acceleration of the contractions of an isolated strip of cat's ileum; the effect of serum from cases of exophthalmic goitre is, however, far greater than that of the serum of normal blood. Thyroid extract also produces augmentation and acceleration of the contractions of the intestinal strip, but the action of thyroid extract is relatively slight compared with that even of normal serum, and the specific autacoid of the thyroid (thyroxin) has no effect in the intestinal strip. Moreover, neither normal blood nor exophthalmic blood, when fed to tadpoles, have any influence upon their metamorphoses, though thyroxin markedly accelerates the metamorphosis of frog tadpoles (tadpole test). These experiments, therefore, lend no support to the view that normal thyroid secretion containing thyroxin is poured into the blood in appreciably increased amount in exophthalmic goitre. Nor do they support the view that the symptoms of the disease are due to the presence of an abnormal amount of free adrenalin in the blood, since if this were the case, the contractions of the intestinal strip would tend to be inhibited instead of being augmented.

TWIN TUBAL PREGNANCY.

ACCORDING to Mr. Leslie B. Arey,[1] of the Anatomical Laboratory, Northwestern University Medical School, Chicago, the commonest plural pregnancy which involves the uterine tubes is the combined tubo-uterine type. One hundred and nineteen cases were collected by Weibel in 1905, although probably some of them were merely presumptive and not all were twins. Plural gestation in the same tube, of which 37 genuine cases were collected by Hardouin in 1919, is next most frequent, while bilateral tubal pregnancies are rarest of all, there being less than a dozen on record. A study of the literature shows that tubal pregnancy, whether single or twin, tends to occur in women who are older by 4½ years (31·0 years) than the average age for motherhood (26·5 years). Two groups of cases may be distinguished. The first which forms three-quarters of the total consists of women who have borne children, but without recent pregnancies, and nearly one-half are multiparæ, many having had abortions. The remaining fourth consists of women who have been married a relatively long time, on an average six years, but without becoming pregnant. The explanation of this sterile interval is to be found in tubal inflammation, which is the chief factor in tubal gestation. An inflammatory process may prevent pregnancy for a variable period either by mechanically blocking fertilisation or by causing young ova to disintegrate, and on subsidence of the inflammation the tube becomes a possible nidus for the growing ovum. Rupture occurs in 58 per cent. of all cases of single tubal pregnancy. It is most frequent in tubes containing normal embryos, less common in tubes in which the embryos are pathological, and rarest in those without embryos but containing degenerated ova, so that a growing normal embryo is a special menace to the mother. Eighty per cent. of the recorded specimens of monochorionic tubal twins have ruptured, but the writer regards this figure as too high, because unruptured specimens with degenerated embryos necessarily escape recognition. The average time of rupture in single tubal pregnancy in 25 cases was at 7·7 weeks, as compared with 10·3 weeks in a series of 28 cases of twin tubal pregnancy, but it is probable that the unusual feature of twinning leads to a more representative collection of the older specimens than in single gestations, so that the later date in the twin group is not really significant. The symptoms of twin tubal pregnancy are identical with the classical picture of ordinary tubal gestation. In 9 out of 36 cases with adequate menstrual histories the embryos were of such size as to indicate that there had been one and in a few cases more than one menstrual period before pregnancy had begun. The condition has radium tubes, without lead filters, into this greyish mass in various directions, the total dose of radium being 11 cgm. A week later the signs and symptoms of severe abdominal disease had vanished, and the child lived to die several months later of acute middle-ear disease. The necropsy showed extensive healing of tuberculosis in the peritoneal cavity and elsewhere. Among the reviews of original papers on tuberculosis in childhood there is one in which the value of a single Pirquet test is shown to be very untrustworthy. Of 800 children thus tested only 537 gave a positive reaction to the first Pirquet test with old tuberculin. Of the remaining 263 cases as many as 170, or 64·6 per cent., gave a positive tuberculin reaction either to a second Pirquet test or to the intracutaneous injection of old tuberculin in varying strengths.

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[1] Quarterly Journal of Experimental Physiology, xiii., 2.

[1] Surgery, Gynecology, and Obstetrics, June, 1923.

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[1] Jour. Roy. Stat. Soc., 1923, lxxxvi., 122.

[1] Hospitalstidende, April 11th and 18th, 1923.

LABORATORY DIAGNOSIS OF VENEREAL DISEASE.

THE first edition of the Medical Research Council's report on the laboratory diagnosis of gonococcal infections and methods for the detection of *Spironema pallidum* is well known to all those engaged in the laboratory diagnosis of venereal disease, and the service which it has rendered in this field of work is undoubted. Unfortunately, it has been unobtainable latterly, having been out of print for some months. It will, therefore, be a matter of great satisfaction to those engaged in venereal diagnosis to know that a second edition[1] is now available. At the important discussion on Metastatic Gonorrhœa, the conclusion of which is reported on p. 18, doubt was thrown on the validity of some of the assumed localisations of gonorrhœal infection, in the absence of actual demonstration there of the virus. The first part of the report, dealing with the laboratory diagnosis of gonococcal infections, which has been revised and brought up to date by Dr. G. T. Western, is therefore of special value. Amongst the improvements to be noted here is the reduction in the number of alternative media given for the cultivation of the gonococcus. The preparation of nutrient agar—which can be enriched with human plasma or serum—and of tryptamine blood-extract agar and broth is dealt with in detail and gives a sufficient choice without being excessive. A valuable addition has been made to that portion of the report by Mr. J. E. Barnard which treats with the demonstration of spirochætes by dark-ground illumination. This is a method for differentiating between *S. pallidum* and other spironemata. Briefly, this method consists in estimating the number of spirals in the spirochæte to a given length, the standard suggested being the diameter of a red blood cell. As it is not a common occurrence to find spironemata in close proximity to red cells in the preparations, an ingenious eye-piece scale has been devised which introduces a number of artificial blood cells into the field of view. The procedure is simple and the apparatus inexpensive, and it should prove of very material aid in arriving at a correct diagnosis. Revising the section which treats of the staining methods to be used for spironemata, Dr. Clifford Dobell has added some valuable advice on the use of Romanowsky stains, which will be read with advantage by those making use of this procedure. The new edition of this report should prove of even greater value than its predecessor.

THE Canadian Parliament has unanimously voted to Dr. F. G. Banting an annuity of $7500 (£1500) to enable him to carry on his scientific work.

THE Gold Medal of the Royal Society of Medicine, "awarded triennially to a scientist, man or woman, who has made valuable contributions to the science and art of medicine," has this year been awarded to Prof. F. Gowland Hopkins, F.R.S., Professor of Biochemistry in the University of Cambridge.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXVII.—THE TREATMENT OF ASTHMA.

USED in its broadest sense, the term asthma is applied to a state of affairs in the smaller bronchi, which hinders the exchange of air between the larger bronchi and the alveoli of the lungs. We know little about the nature of the obstruction, but arguing from the analogy of the plain muscle of the intestine or bladder, we may assume that the bronchial muscle, which possibly contracts slightly during each normal expiration, may in asthma at one time be tonically contracted, and at another time undergoing a series of violent rhythmic contractions and relaxations. Œdema or congestion of the mucous membrane may also play a part, and is, perhaps, especially important in those cases where there is sensitisation to foreign proteins, inasmuch as the latter may produce œdema elsewhere—e.g., urticaria or angio-neurotic œdema.

From the definition given above we see that the term asthma is often used to denote a symptom, or perhaps a syndrome, rather than a disease—a syndrome in fact that may be caused by different agents. Thus in considering the treatment of asthma it is essential to diagnose the underlying cause.

(1) *Sensitisation to a Foreign Protein.*

In this case the asthma may be associated with other symptoms, such as coryza, gastro-intestinal disturbances, urticaria, angio-neurotic œdema, eczema, or acute dermatitis. Hay fever due to grass pollen is the commonest variety, but there are also the animal asthmas, where the hairs or feathers are responsible, and sensitiveness to certain foods or beverages, such as cereals, eggs, potatoes, lobster, strawberries, cocoa, &c. These foods usually produce gastro-intestinal disturbances in susceptible people, but asthma may occur as well. Finally, there may be a sensitiveness to micro-organisms of the respiratory or alimentary tracts, or to certain drugs. In some cases the diagnosis follows from the history of the case. But in any case, testing may be carried out with a series of proteins, which can be obtained commercially. The skin after cleaning is slightly scarified, and the solution of the protein applied by means of a platinum loop. If the protein is in powder form, it may be added to a drop of N/10 sodium hydrate, which has been placed over the scarified area. An urticarial wheal of at least ¼ inch in diameter indicates a positive result. Single protein testing, though it gives more satisfactory results, is a rather tedious business, and can be made shorter by the combination of various allied proteins—e.g., cat's, dog's, and horse's hair into a group, with various feathers, so that a single test answers for several different proteins. Some workers in this country and America have found that as many as 50 per cent. of asthmatics are sensitive to some foreign protein; but usually the positive results are much fewer than this. Sometimes patients rather disconcertingly react once and fail to react next time.

If a particular protein is answerable the best treatment is to avoid its presence altogether. Hay fever patients should stay in town in the early summer, or use a thick veil when walking in the country. Articles of diet containing the specific substance should not be eaten. If prevention is unsuccessful, desensitisation may be carried out by means of hypodermic injections of the specific protein in gradually increasing doses. Oral administration has also been carried out, particularly in France. These various antigens may be obtained commercially. Sensitiveness in hay fever may be tested by subcutaneous injections or by dropping solutions, gradually increasing in strength, of a mixture of pollen extracts into the eye, and after a few minutes examining for slight signs of inflammation. When a reaction is obtained, desensitisation may be carried out by injecting 1 c.cm. of a solution slightly weaker than that never yet been diagnosed before operation, but the writer suggests that in older cases a diagnosis might be established by X rays. The outcome of twin tubal pregnancies is recorded in 40 cases: 29 recovered, 10 died, and 1 was not recognised until the autopsy.

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[1] Medical Research Council Special Report Series, No. 19 revised). H.M. Stationery Office. Price 1s. 6d.

ARE FEMALES LOSING THE ADVANTAGE OF LOW MORTALITY?

THE differences in vitality of the two sexes are of perennial interest to the physician as well as to the statistician, and no completely satisfactory explanation of these differences at various ages has been advanced. Both in the United States and in this country this difference is shown even in the first year after birth. Thus in the year 1920 in the registration area of the United States the female death-rate among infants under 1 year of age was 20 per cent. and in England and Wales was 23 per cent. lower than the male infant death-rate, and an excess of male over female rate of mortality was shown consistently in each month of infancy. After infancy in the United States the excess of male over female mortality continues throughout each stage of life; while in England and Wales at ages 10–15 there is seen some excess of female over male mortality. The ages at which this excess of female over male mortality occurs in England have gradually narrowed with the course of time; and the absence of this feature in America is interesting.

In the May issue of the *Statistical Bulletin* of the Metropolitan Life Insurance Company of New York attention is drawn to the fact that in the experience of persons insured in this company a reversal of the usual relationship occurred, the female mortality at all ages exceeding the male by 2·6 per cent. in 1920, while the male excess in 1922 was 1·2 per cent. Among white insured persons an excess of female mortality over male occurred at ages 15–35 in 1920. These oscillations in the relation of male to female mortality are interesting, but their explanation is obscure. The factors producing this result are not confined to insured persons, for in 1920 taking the whole of the American registration area the death-rate at ages 20–25 and at ages 25–35 was higher in women than in men. These differences of experience in the American statistics will deserve further study, directed to a determination of the causes of excess of female over male mortality in each age-period. It is probable that similar studies of various large towns in this country would reveal exceptional sex-incidence of mortality at different ages, and that thus much light might be thrown on possibilities of preventive work. A great difficulty in pursuing this line of investigation is constituted by the delay in the issue of the census reports for a large number of counties, as without a statement of the 1921 population according to age and sex detailed death-rates cannot be calculated.

CHRONIC ECZEMA PRODUCED BY WHEAT-FLOUR.

A CASE of sensitisation to wheat-flour which produced chronic eczema is well reported[1] by Dr. H. Grenet and Dr. R. Clement. A woman of 63 had developed the trouble at 40; the lesion was so extensive and itched so badly as to preclude sleep, and this in spite of constant attempts at treatment. Inquiries into the family history showed nothing—no eczema that is, for the authors do not say if other types of toxic idiopathy were looked for. Finding that among the various drastic food restrictions bread seemed to be the only foodstuff which had never been curtailed, they prescribed a normal dietary, minus bread; and bread proved indeed to be the disturbing factor, for the patient improved forthwith. It is worth noting that a very definite intradermal reaction was obtained with flour mixed with normal serum, but this mixture gave no skin reaction. At this stage 100 g. of bread were deliberately administered and produced the typical blood crisis—drop of pressure in five minutes and a leucopenia reaching a maximum after 45 minutes. Desensitisation was effected with the same wheat and serum mixture; details are given in culinary terms—"one coffee-spoon of flour to two dessert-spoons of serum"; doses of half and later of 1 c.cm. of this mixture proved effective in spite of a somewhat sharp general reaction. The patient was then habituated to a bread diet by easy stages, till after three months she was allowed normal diet. Even then she was afraid to eat green peas or strawberries—foods which had previously provoked attacks of eczema; but on trial she found that these no longer harmed her. This additional success the authors ascribe to a wide group-desensitisation; and, given any specificity at all, the group must indeed be wide which includes wheat, strawberries, and green peas! We would suggest rather that, on the summation theory of protein irritants, while bread had been a constant factor making for trouble any other irritant could always produce an increase of symptoms, but with the wheat factor removed by desensitisation other and slighter irritants were not enough to cause an attack. The authors quote another less clearly established instance of wheat-eczema, and note that Sabouraud has pointed out the dangers of bread in certain cases; they conclude that such cases are commoner than is generally supposed. This may be true; but it is also true that seldom can the protein cause for eczema and asthma be established as quickly and certainly as in the case of Dr. Grenet and Dr. Clement.

BILHARZIAL APPENDICITIS.

Dr. C. H. Bailey and Dr. E. A. Bullard,[1] of Woman's Hospital, New York, who describe a case which came under their own observation, remark that though infections with the trematode parasite schistosoma are very common in certain parts of the world, especially Africa, cases in which the symptoms are confined to the vermiform appendix are extremely rare. As is well known, the commonest sites of infection by the *Schistosoma hæmatobium* described by Bilharz in 1852 are the bladder and urethra, rectum, vulva, and vagina. Urinary symptoms, especially hæmaturia, are the commonest, both in the male and in the female, in whom bilharzia infections, according to Burfield, are 24 times less frequent than in the male. The writers have been able to find only two previous cases on record in which symptoms of bilharzia infection were confined to the appendix. The first was that described by J. Burfield in THE LANCET[2] in a man aged 36, in whom abundant ova of schistosoma were found in the submucosa of a suppurating appendix. The patient had no symptoms of genito-urinary or rectal involvement. The other case is one attributed to Aireton by Kelly of exclusive localisation of the ova of the parasite in the appendix, but no further description is given. The writers' case occurred in a woman, aged 25, who had lived in South Africa until she was 15. Her chief complaints were sterility, dysmenorrhœa, and frequent dull pains in the right lower quadrant of the abdomen for nearly two years. Examination showed an undeveloped uterus with stenosis of the cervix and evidence of chronic appendicitis which was confirmed by operation, when the entire meso-appendix and distal two-thirds of the appendix were found to be thickly studded with tiny greyish-white nodules resembling tubercles. Microscopical sections showed that the nodules were present in moderate number in the submucous and serous coats and throughout the meso-appendix. There were none in the mucous membrane or muscular layer. The nodules contained one or more ova with a very definite cell membrane, some of which were calcified. Numerous giant cells with many nuclei were seen adjacent to or completely surrounding an ovum. In the older lesions the ovum was surrounded by dense fibrous tissue. Examination of the blood one month after the operation showed a leucocytic count of 5600; polymorphonuclears, 24 per cent.; small lymphocytes, 52 per cent; large mononuclears, 7 per cent.; eosinophils, 17 per cent. No ova were found in the stools. Improvement took place under treatment by intravenous injections of sodium antimony tartrate in 2 per cent. solution, until in May, 1922, 14 months after the operation, the blood count showed that the eosinophils had fallen to 1·5 per cent. In the following August the patient was in excellent health and no evidence of bilharzia was found.

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[1] Bulletins et Mémoires de la Soc. Méd. des Hôpitaux de Paris, June 7th.

[1] Surgery, Gynecology, and Obstetrics, May, 1923.

[2] THE LANCET, 1906, i., 368.

LABORATORY DIAGNOSIS OF VENEREAL DISEASE.

THE first edition of the Medical Research Council's report on the laboratory diagnosis of gonococcal infections and methods for the detection of *Spironema pallidum* is well known to all those engaged in the laboratory diagnosis of venereal disease, and the service which it has rendered in this field of work is undoubted. Unfortunately, it has been unobtainable latterly, having been out of print for some months. It will, therefore, be a matter of great satisfaction to those engaged in venereal diagnosis to know that a second edition[1] is now available. At the important discussion on Metastatic Gonorrhœa, the conclusion of which is reported on p. 18, doubt was thrown on the validity of some of the assumed localisations of gonorrhœal infection, in the absence of actual demonstration there of the virus. The first part of the report, dealing with the laboratory diagnosis of gonococcal infections, which has been revised and brought up to date by Dr. G. T. Western, is therefore of special value. Amongst the improvements to be noted here is the reduction in the number of alternative media given for the cultivation of the gonococcus. The preparation of nutrient agar—which can be enriched with human plasma or serum—and of tryptamine blood-extract agar and broth is dealt with in detail and gives a sufficient choice without being excessive. A valuable addition has been made to that portion of the report by Mr. J. E. Barnard which treats with the demonstration of spirochætes by dark-ground illumination. This is a method for differentiating between *S. pallidum* and other spironemata. Briefly, this method consists in estimating the number of spirals in the spirochæte to a given length, the standard suggested being the diameter of a red blood cell. As it is not a common occurrence to find spironemata in close proximity to red cells in the preparations, an ingenious eye-piece scale has been devised which introduces a number of artificial blood cells into the field of view. The procedure is simple and the apparatus inexpensive, and it should prove of very material aid in arriving at a correct diagnosis. Revising the section which treats of the staining methods to be used for spironemata, Dr. Clifford Dobell has added some valuable advice on the use of Romanowsky stains, which will be read with advantage by those making use of this procedure. The new edition of this report should prove of even greater value than its predecessor.

THE Canadian Parliament has unanimously voted to Dr. F. G. Banting an annuity of $7500 (£1500) to enable him to carry on his scientific work.

THE Gold Medal of the Royal Society of Medicine, "awarded triennially to a scientist, man or woman, who has made valuable contributions to the science and art of medicine," has this year been awarded to Prof. F. Gowland Hopkins, F.R.S., Professor of Biochemistry in the University of Cambridge.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXVII.—THE TREATMENT OF ASTHMA.

USED in its broadest sense, the term asthma is applied to a state of affairs in the smaller bronchi, which hinders the exchange of air between the larger bronchi and the alveoli of the lungs. We know little about the nature of the obstruction, but arguing from the analogy of the plain muscle of the intestine or bladder, we may assume that the bronchial muscle, which possibly contracts slightly during each normal expiration, may in asthma at one time be tonically contracted, and at another time undergoing a series of violent rhythmic contractions and relaxations. Œdema or congestion of the mucous membrane may also play a part, and is, perhaps, especially important in those cases where there is sensitisation to foreign proteins, inasmuch as the latter may produce œdema elsewhere—e.g., urticaria or angio-neurotic œdema.

From the definition given above we see that the term asthma is often used to denote a symptom, or perhaps a syndrome, rather than a disease—a syndrome in fact that may be caused by different agents. Thus in considering the treatment of asthma it is essential to diagnose the underlying cause.

(1) *Sensitisation to a Foreign Protein.*

In this case the asthma may be associated with other symptoms, such as coryza, gastro-intestinal disturbances, urticaria, angio-neurotic œdema, eczema, or acute dermatitis. Hay fever due to grass pollen is the commonest variety, but there are also the animal asthmas, where the hairs or feathers are responsible, and sensitiveness to certain foods or beverages, such as cereals, eggs, potatoes, lobster, strawberries, cocoa, &c. These foods usually produce gastro-intestinal disturbances in susceptible people, but asthma may occur as well. Finally, there may be a sensitiveness to micro-organisms of the respiratory or alimentary tracts, or to certain drugs. In some cases the diagnosis follows from the history of the case. But in any case, testing may be carried out with a series of proteins, which can be obtained commercially. The skin after cleaning is slightly scarified, and the solution of the protein applied by means of a platinum loop. If the protein is in powder form, it may be added to a drop of N/10 sodium hydrate, which has been placed over the scarified area. An urticarial wheal of at least ¼ inch in diameter indicates a positive result. Single protein testing, though it gives more satisfactory results, is a rather tedious business, and can be made shorter by the combination of various allied proteins—e.g., cat's, dog's, and horse's hair into a group, with various feathers, so that a single test answers for several different proteins. Some workers in this country and America have found that as many as 50 per cent. of asthmatics are sensitive to some foreign protein; but usually the positive results are much fewer than this. Sometimes patients rather disconcertingly react once and fail to react next time.

If a particular protein is answerable the best treatment is to avoid its presence altogether. Hay fever patients should stay in town in the early summer, or use a thick veil when walking in the country. Articles of diet containing the specific substance should not be eaten. If prevention is unsuccessful, desensitisation may be carried out by means of hypodermic injections of the specific protein in gradually increasing doses. Oral administration has also been carried out, particularly in France. These various antigens may be obtained commercially. Sensitiveness in hay fever may be tested by subcutaneous injections or by dropping solutions, gradually increasing in strength, of a mixture of pollen extracts into the eye, and after a few minutes examining for slight signs of inflammation. When a reaction is obtained, desensitisation may be carried out by injecting 1 c.cm. of a solution slightly weaker than that which caused the ophthalmic reaction, and repeating this every three or four days. The ophthalmic reaction may be re-determined at intervals, and the amount of the injections regulated accordingly. Hydrated calcium chloride in doses of 15 gr. dissolved in water three times a day may be of value in the prevention of hay fever.

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[1] Medical Research Council Special Report Series, No. 19 (revised). H.M. Stationery Office. Price 1s. 6d.

(2) *Idiopathic Asthma.*

In the same way that certain people seem to be affected with an irritable stomach, so we must imagine that a peculiarly sensitive neuro-muscular mechanism in the smaller bronchi is responsible for this group of asthma cases. In such people reflex disturbances in other parts of the body, hidden infection, and emotions may cause attacks. The attack may come on merely because the patient expects it; much good may be done by encouraging him to fight against this kind of suggestion. Worry, excessive physical or mental strain—e.g., sitting for examinations or overwork—must be avoided. If possible, a climate and surroundings should be chosen that suit the patient. The bowels must be made to act regularly; daily exercise should be taken in the fresh air; holidays should be regular. Indigestible food must be avoided, particularly at night.

Sources of infection must be eradicated, especially carious teeth showing apical infection. Dental X ray films may be of great value in diagnosis. The tonsils must be examined for disease and removed if heavily infected. Autogenous vaccines may be used. Care must be taken that children are not mouth-breathers, and, if so, simple respiratory exercises, such as deep inspirations through the nose, should be practised three or four times a day. It may be necessary to remove adenoids. In previous years various operations on the nose have had considerable vogue in the treatment of asthma, but they are now less popular.

Of recent years non-specific protein therapy has been used for asthma. The successful results obtained with stock vaccines made up from catarrhal organisms or mixed strains of *B. coli* are probably not due to their specificity against particular organisms present in the naso-pharynx or bronchi of the individual; they act because they contain foreign proteins. Peptone injections are often used for the same reason. Auld[1] advises a 5 per cent. solution of Armour's No. 2 peptone injected intramuscularly or intravenously. The first dose is 0·3 c.cm., and is gradually increased by 0·2 c.cm., the maximum dose being 2 or 2·5 c.cm. Injections are given twice weekly. The maximum dose advisable is one that just fails to give a reaction, and the temperature should be taken four or five hours after the injection, to see whether it is raised. Peptone is also given orally. Liquor arsenicalis in 5-minim doses, bromides, and particularly potassium iodide in doses up to 30 gr. a day are the most valuable drugs to prevent the onset of attacks. Mild purgation with calomel in small doses is also of value, and salol and other intestinal disinfectants have been used.

(3) *Asthma due to Infection of the Respiratory Tract.*

Asthma is often secondary to acute or chronic catarrhal infection of the upper respiratory tract, so that if the latter can be prevented or arrested, the attacks of asthma will cease. The treatment devised by Mr. Wilfrid Glegg of Birmingham is of the greatest value for naso-pharyngeal infection, and should always be tried before more elaborate means are adopted. The following is a simple way of carrying it out. A nasal funnel (these are made for me by Down Bros.) is filled with a mixture of 1 part white vaseline and 3 or 4 parts of liquid paraffin. This is allowed to run down each nostril in turn with the patient in a recumbent position, until it is felt in the naso-pharynx, when it may be swallowed. This process is carried out night and morning in chronic infection, but should be repeated 4-hourly to prevent the onset of an acute coryza, as soon as the first symptoms are noticed. It is not always possible to prevent altogether the onset of some tracheitis and bronchitis, but in my experience they are less severe than if the naso-pharyngeal infection had run its usual course.

Autogenous vaccines may be prepared from the sputum, or from swabs passed through the anterior nares into the naso-pharynx or from the naso-pharynx directly. Immediate planting out and incubation of the material is advisable. Stock vaccines may be employed, and these bacterial infections may yield to non-specific protein therapy as already described. In the chronic bronchitis and asthma so common in elderly people, many of the drugs detailed below may be used, but in addition expectorants will be useful for the bronchitis, and it may be necessary to treat incipient cardiac failure. Asthma may be present with phthisis, and treatment of the phthisis may relieve the asthma.

(4) *Treatment of an Asthmatic Attack.*

A large number of drugs have been successful in cutting short an attack of asthma or in relieving the difficulty of breathing that persists after the climax of the attack is over. A subcutaneous injection of 1 or 2 ♏ of adrenin (1 in 1000) may answer, though 10 or even 15 ♏ have been injected intramuscularly. Recently, benzyl benzoate has been administered in 20-drop doses 4-hourly, by the mouth or subcutaneously. Maximal pharmacopœial doses of tr. lobeliæ æth., tr. stramonii, tr. belladonnæ, choral hydrate, the nitrites, or nitro-glycerine may be given by mouth. Inhalation of amyl nitrite, chloroform, or the fumes made by igniting the B.P.C. mixture of potassium nitrate, lobelia, stramonium leaves, and anise fruit in equal parts, are often used during the acute attack, and cigarettes containing stramonium are smoked; but a warning must be sounded in regard to the frequent inhalation of fumes, as they irritate the bronchi, causing inflammation, and this predisposes to future attacks. Injections of atropine gr. 1/100 to 1/50 may be of value, but morphia, although very effective, must not be used if the attacks are frequently repeated, and the same applies to sprays containing cocaine.

Great relief will be experienced with oxygen inhalation, which, to be effective, must be given by means of a mask, such as that supplied with Haldane's apparatus (an anæsthetic mask will answer satisfactorily) or by means of a nasal catheter pushed right back into the naso-pharynx. The secret of successful oxygen treatment is to give it in sufficient quantity. It may be bubbled through water, so quickly that the bubbles cannot be counted. The flow must be at least 2 litres a minute to begin with, and if there is no gauge on the cylinder, it is a simple matter to test the rate by delivering the oxygen through a rubber tube beneath a pint measure which has been filled with water and inverted in a basin of water. The flow should be quick enough to displace the water in from 15 to 20 seconds. Attacks may also be stopped by hot baths, particularly if the patient inspires cool air from an inhaler which has been packed with ice.

(5) *Breathless Attacks in Elderly Subjects.*

Many elderly people are prone to attacks of breathlessness, particularly at night-time. The heart not uncommonly shows some evidence of failure, and the patients also notice that they soon get out of breath with exercise. There is emphysema and the breathing at times may become periodic, somewhat resembling Cheyne-Stokes respiration. Such cases have been called cardiac asthma. There may be some albuminuria, but although the urea in the blood is perhaps a little raised, there is no increase of fixed acid, and so these cases are not uræmic. Their pathology is rather obscure, but some recent evidence[2] points to the breathless attacks being due to bronchial spasm. Antispasmodic remedies may be of some value, but oxygen is the chief stand-by. Here again it is important to use a comparatively rapid flow, and administer it through a mask and valves, or nasal catheter. The wasteful and ineffective glass funnel should not be used.

E. P. POULTON, M.D. Oxf., F.R.C.P. Lond.,
Physician to Guy's Hospital.

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[1] THE LANCET, 1921, i., 698.

[2] Campbell, Hunt, Poulton: Jour. Path. Bact., 1923, xxvi., 234.

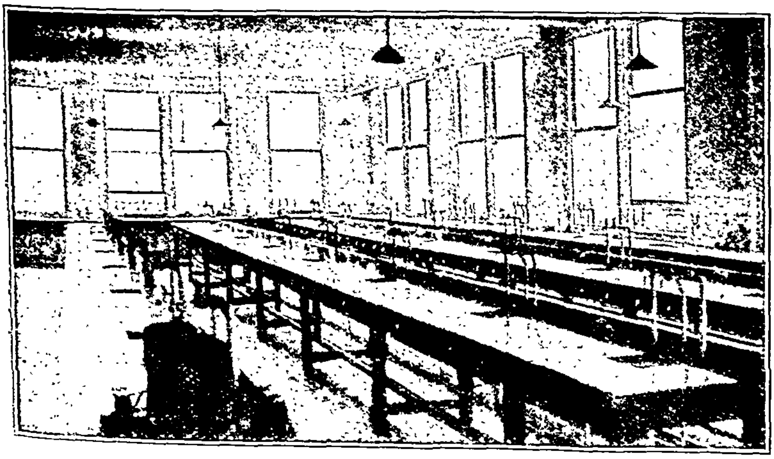
Special Articles.

GUY'S HOSPITAL MEDICAL COLLEGE.

NEW ANATOMY, BIOLOGY, AND PHYSICS DEPARTMENTS.

BEFORE a distinguished company the formal opening of the new Anatomy, Biology, and Physics Departments by the Prince of Wales, President of the hospital, took place on July 2nd. The Prince, who was received by the Treasurer of the Hospital, Lord Goschen, and Mr. H. J. Waring, Vice-Chancellor of the University of London, proceeded to a platform erected outside the Medical School, where an address was read by the Dean of the Medical School, Dr. T. B. Johnston. In the address the scheme of rebuilding the Medical School, begun in 1897 with the physiology department and now completed by the opening of this new extension, was outlined, as well as the means by which financial difficulties were overcome, at least temporarily. The total cost of the buildings was £100,000, and part of this had to be found by borrowing; it was hoped that other benefactors would come forward to relieve the school of the incubus of debt and so enable it to carry on the work in a manner worthy of the great traditions of Astley Cooper, Bright, Addison, Gull, and Wilks. The Prince of Wales, in opening the new extension, referred to the great value of medical research and to the national importance of the work of the great voluntary hospitals and their medical schools. Science and industry alone were not enough; the sinews of war on disease must also be forthcoming, and the door of the treasurer's department was open as continuously as that of the hospital. A vote of thanks to His Royal Highness, proposed by Dr. J. Fawcett, senior physician, and seconded by Sir Alfred Fripp, senior surgeon to the hospital, was carried with acclamation, after which the Prince inspected the new buildings. After the ceremony the guests and friends of the hospital had an opportunity of inspecting the Medical School buildings as well as the wards of the hospital.

FIG. 2.



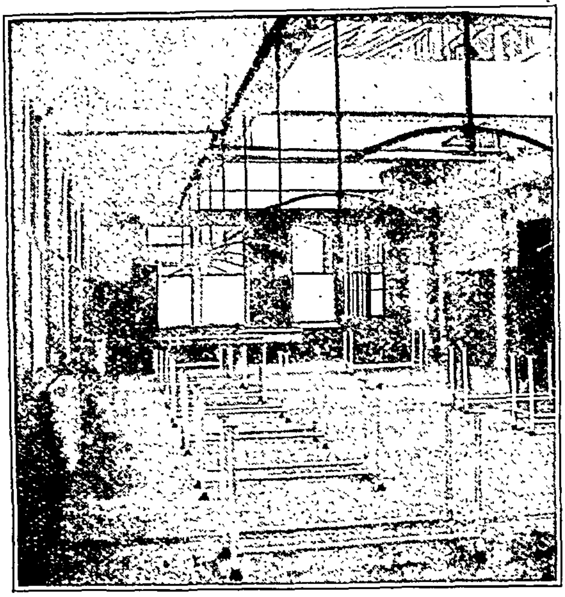
The new department of histology.

Refreshments were served in marquees in the grounds and the band of H.M. Coldstream Guards played appropriate music.

The New Buildings.

The extension provides new anatomical, biological, and physics departments, together with additional accommodation for physiology and surgery. Every possible means has been taken to render the interior of the building as light as possible, the external walls having large windows on three sides and the interior walls being of white glazed brick below and having glass partitions above as far as practicable. In the dissecting room, the operative surgery room, and the surgical research room, terrazo flooring replaces the wood blocks used in the rest of the building. The building comprises three floors and a basement; the roof has been made flat with a view to providing space for animal hutches and water tanks for breeding fresh water animals. The third floor is entirely devoted to human anatomy and contains a dissecting room, 80 feet by 24 feet, magnificently lit by large windows on three sides and by a large roof light, and having novel and elaborate arrangements for artificial lighting over each of the 16 tables (Fig. 1). A small demonstration theatre, capable of seating 50 students, leads off the dissecting room. There are also two specimen rooms and assistants' rooms. On the second floor is the histology laboratory, with well-arranged bench room for 73 students; communicating with the laboratory is a preparation room, where section cutting will be done for the anatomy, biology, and morbid histology departments, and for the Gordon Museum. Two small laboratories on this floor are intended for the private use of the lecturer on anatomy and the demonstrators, and there is also a large specimen room where reconstruction models of human and mammalian anatomy and embryology will be housed. The first floor is divided between the biology department, the physics department, and an operative surgery room, with a small surgical research room to be equipped as an operating theatre for experimental work on animals. The students' biology laboratory resembles the histology laboratory on the floor above, with slight modifications in the bench equipment and lighting. The physics department consists of a laboratory providing bench room for 50 students, an optical room, which will be shared by the physiology department, and research rooms for the lecturer and his demonstrators. The physics laboratory is equipped

FIG. 1.



The new dissecting room.

with teak-topped tables in which are covered sunken wells with a sink and water, electric and gas connexions. Power connexions are disposed where necessary. In the basement there are a number of rooms devoted to the anatomy department as well as a demonstration theatre capable of seating 70 students. There is a well-ventilated tank-room, connected with the other floors by an electric lift, a reception and preparation room, a store room, and a large workroom equipped with a machine for cutting frozen anatomical sections, as well as photomicrographic and dark rooms.

The new extension here described was designed largely with the object of providing better facilities for collaboration between the various non-clinical departments which are now, with the exception only of pathology and pharmacology, all housed under one roof. A rather striking rearrangement is the grouping of histology with human anatomy, but this is in line with the view that the study of microscopic and macroscopic anatomy should be closely associated. The provision of a room for surgical research in close association with the anatomy department was also well planned, and should be fruitful in work useful to the school and hospital. It is unfortunate, but inevitable, in such a district as the Borough that the new extension should be partly overshadowed by neighbouring buildings, so that, in spite of the very large window space, the lighting on the lower floors is not very good. This is particularly noticeable in the physics laboratory, where artificial lighting has had to be provided on a lavish scale, and applies also, though in lesser degree, to the histology laboratory. The lighting of the dissecting room, however, is magnificent, and this is perhaps the only department in which it is essential.

The buildings as a whole are admirably equipped, and students of Guy's cannot fail to react to the stimulating effect of spacious rooms so well adapted to their purpose. We congratulate them on their new college.

RESEARCH IN TROPICAL DISEASE.

III. The Lister Institute of Preventive Medicine.

Throughout its history the Lister Institute has never ceased to take an active share in elucidating problems of vital importance in tropical disease. It has been enabled to do so, not so much by the despatch of scientific experts to tropical regions, though this form of activity has by no means been ignored when the necessary funds permitted, as by providing facilities for systematic research, both static and experimental, in those basal sciences protozoology, entomology, bacteriology, experimental pathology, and biochemistry, &c., which determine more and more, as time goes on, the lines of solid advance.

In 1906 the late Prof. Minchin was granted laboratory accommodation in the Institute for his work as university professor of protozoology. A special department of protozoology was thus formed in which systematic research on protozoa generally, as well as on those responsible for disease in man and animals, could be intensively followed. Even before the arrival of Minchin some notable studies on the experimental infection of rats with trypanosomes and the influence of chemotherapeutic agents on such infections, by the late Prof. Plimmer and various collaborators, had emanated from the Institute. From Prof. Minchin's department came many important contributions to our knowledge of trypanosomes and, more especially, of their developmental cycles in hosts like the tsetse-fly and the rat flea. Both Prof. Minchin and Miss Muriel Robertson also enjoyed a lengthy field experience in Uganda in connexion with their trypanosome studies. The Indian Plague Commission, appointed jointly by the Secretary of State for India, the Royal Society, and the Lister Institute, engaged the services of various Institute experts, all of whom contributed materially, whether at home or at Bombay, to the solution of the plague problem as one determined essentially by the bionomics of the rat flea. To other plague-stricken areas, Manchuria, Egypt, &c., the Institute has lent its experts. In 1911 a department of entomology was instituted, in charge of which was placed the late Arthur Bacot, whose unique talents, already displayed in working out the bionomics of the rat flea on behalf of the Plague Commission, were thus recognised. Bacot's achievements during the following 12 years up to his lamented death from typhus in 1922 are possibly fresh in the minds of many readers, but here may be mentioned his work with C. J. Martin on the precise mechanism by which *B. pestis* is transferred from flea to rat, his elaborate study of the bionomics of *Stegomyia fasciata* for the West African Yellow Fever Commission, and his last experimental studies on the viruses of trench fever and typhus fever carried out at home, in Poland, and in Egypt.

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INAUGURATION OF WARDS AT MIDDLESEX HOSPITAL.

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Coöperation between St. Luke's and Middlesex Hospitals.

Lord Athlone, treasurer of the Middlesex Hospital, expressed his gratitude to the authorities of St. Luke's Hospital for the part they had played in bringing about the establishment of these wards. The principle of coöperation between general and special hospitals had been widely discussed and generally accepted, but he believed this to be the first example of carrying it into practice. Mr. Arthur Cross Powell, treasurer of St. Luke's Hospital, mentioned the fact that St. Luke's was founded in 1751, only six years later than the Middlesex, and had spent the greater part of its existence on a site which, although ample in size and held on a perpetual lease at an exceedingly low rental, had come to be surrounded by tram-routes, the noise of which by day and by night hardly contributed to the well-being of the patients. A few years ago the new site had been acquired in Buckinghamshire, and it was hoped to proceed with building there at an early date. He welcomed coöperation with the Middlesex Hospital in the present venture, and wished and predicted every success to it. Sir Coles Child described the new wards as a step beyond the out-patient departments which have already been established at some mental hospitals for the benefit of the same type of patient. The utility of these departments was seriously discounted by the fact that many people objected to going anywhere near an asylum. The present arrangement obviated this, while providing treatment by the staff of an institution devoted to the care of the insane. He saw no reason why general and mental hospitals should not coöperate in this way throughout the country. Dr. C. Hubert Bond, Commissioner of the Board of Control, expressed his great personal satisfaction, and that of the Board of Control, at the step which had been taken. Hitherto, the general hospital out-patient department had presented an impervious screen which no case of mental disease had been allowed to pass. He had long hoped that the Middlesex would find the means of doing something for these patients, and had advocated a scheme of this nature some years ago. The doors were now open, and he hoped that all teaching hospitals would follow suit.

The New Wards.

The new wards occupy the second floor of the out-patient department, which has been reconstructed for the purpose, and consist of a male and a female ward, each containing three beds, and lavatories, bathrooms, and nurses' room. The wards present a most attractive and restful appearance, being well-lighted, quiet, cool, and tastefully decorated in the manner of a bedroom in a comfortable private house. These wards are intended for the treatment of such cases of functional nervous disorder as appear likely to derive benefit by hospital in-patient treatment. Chronic cases, and those which have failed to respond to treatment elsewhere, as well as patients likely to cause annoyance to others, or cases of frank insanity, will not be admitted. Patients will be admitted from the out-patient department of the Middlesex Hospital, and during treatment they will be under the supervision of Dr. R. W. Gilmour, who was assistant medical officer of St. Luke's in its last years in the City. The resources of all the special departments in the hospital will be available for such methods of investigation and treatment as are found desirable.

NATIONAL BABY WEEK CONFERENCE.

THE Conference opened on Monday, July 2nd, and owing to the large number of delegates was held in the Caxton Hall instead of at Carnegie House, as originally intended.

Dr. G. F. STILL took the chair at the morning session, when the presidential address was delivered by the Rt. Hon. NEVILLE CHAMBERLAIN, M.P., Minister of Health. He said that, in his opinion, the most urgent matters calling for attention in regard to maternity and child welfare were an increase in the number of infant welfare centres and of health visitors, and schemes of this kind would be regarded by him with a favourable eye. He would like to see further provision to assist in reducing maternal and early infantile mortality, in which but little progress had been made, and an improved midwifery service. A great debt was owed to volunteers who started maternity and child welfare work, and there was no sphere in which voluntary assistance could be more profitably employed.

Dr. J. S. FAIRBAIRN opened the discussion on the

Causal Factors of Infant Mortality up to One Month of Age,

dealing specially with the antenatal causes. Maternal disease and prematurity, he said, were conditions largely affecting early infantile mortality, and the diseases likely to damage the child were those in which there was some poison of the system, chemical or bacterial, or where there was formation of deleterious products in the body or accumulation owing to defective elimination. Diseases due to poisons formed within the body included the group known as toxæmias of pregnancy, of which eclampsia was the most dramatic example; those due to defective elimination covered albuminuria, kidney disease, and the like, any of which might terminate the pregnancy or cause early death of the infant. It was common knowledge among obstetricians that mothers seriously ill often had average infants; the placenta and placental cells had first claim, and the fœtus lived like a parasite on the mother. Syphilis—a common cause of stillbirth and infantile death—was a curable disease, but hard to recognise in women at an early stage. Toxæmias of pregnancy, on the other hand, were usually easy to diagnose but hard to treat.

Dr. EARDLEY HOLLAND considered that intranatal causes of death might be summed up in the one word "injuries," the majority being injuries to the head. The delicate structure of the head at birth was liable to injury from forceps or even in spontaneous birth where there was a contracted pelvis. Tearing of the dura mater and cerebral hæmorrhage were specially apt to occur in premature cases, and intracranial injuries were frequent in breech presentations, the injury being caused by too quick rather than too slow delivery of the after-coming head. Dr. Holland had, in his experience, seen one infant of seven months, who died of something else, in whom a healed tear was visible.

Prof. LOUISE MCILROY said that birth should be considered as an episode, the nine previous months being regarded as equally important with later life. She believed sepsis was usually introduced by lacerations, however small they might be. In the period of rather more than two years that her special department had been working at the Royal Free Hospital there had been no case of eclampsia. The babies were not subjected to violent artificial respiration with exposure to cold air, but were wrapped in a warm towel, their respiratory passages cleared of mucus, and left quiet. They were oiled, but not washed for three days, to prevent shock and loss of heat.

The afternoon discussion on the

Value of Maternity Homes in a Maternity and Child Welfare Scheme.

was interesting for the variety of opinions expressed. Dr. JANET CAMPBELL, as chairman, said that the Ministry of Health's policy of a large number of small maternity homes had been criticised on the scores of extravagance in expenditure and staff, the difficulty of maintaining a high standard of midwifery practice in isolated units, and the small value of such institutions as training schools, all of which criticisms she thought were justified. In 1922 there were 107 maternity homes with 1275 beds; some had not been used to their full capacity, and Dr. Campbell thought that fees had perhaps proved deterrent though they were not meant to be so. There was some discussion as to the class of patient who should be eligible for maternity homes, most speakers favouring the view that they should be for normal cases. Differing views were held as to the advisability of utilising isolation hospitals for maternity cases, Dr. W. ALLEN DALEY and Dr. S. G. MOORE both approving the idea, Miss J. C. WISHART thinking it unwise, and Dr. E. R. WOODHOUSE, of Llandudno, feeling convinced that patients would be frightened to use them. A refreshing speech was made by Councillor Mrs. LEWIS, of Barry, who said she spoke as a working woman, and knew that the women of Barry regarded the home made for them by their own man as the only proper place in which to have their babies. She would greatly like to see a rota of efficient home helps who would take complete charge of the work of the homes for at least a fortnight.

with teak-topped tables in which are covered sunken wells with a sink and water, electric and gas connexions. Power connexions are disposed where necessary. In the basement there are a number of rooms devoted to the anatomy department as well as a demonstration theatre capable of seating 70 students. There is a well-ventilated tank-room, connected with the other floors by an electric lift, a reception and preparation room, a store room, and a large workroom equipped with a machine for cutting frozen anatomical sections, as well as photomicrographic and dark rooms.

The new extension here described was designed largely with the object of providing better facilities for collaboration between the various non-clinical departments which are now, with the exception only of pathology and pharmacology, all housed under one roof. A rather striking rearrangement is the grouping of histology with human anatomy, but this is in line with the view that the study of microscopic and macroscopic anatomy should be closely associated. The provision of a room for surgical research in close association with the anatomy department was also well planned, and should be fruitful in work useful to the school and hospital. It is unfortunate, but inevitable, in such a district as the Borough that the new extension should be partly overshadowed by neighbouring buildings, so that, in spite of the very large window space, the lighting on the lower floors is not very good. This is particularly noticeable in the physics laboratory, where artificial lighting has had to be provided on a lavish scale, and applies also, though in lesser degree, to the histology laboratory. The lighting of the dissecting room, however, is magnificent, and this is perhaps the only department in which it is essential.

The buildings as a whole are admirably equipped, and students of Guy's cannot fail to react to the stimulating effect of spacious rooms so well adapted to their purpose. We congratulate them on their new college.

RESEARCH IN TROPICAL DISEASE.

III. THE LISTER INSTITUTE OF PREVENTIVE MEDICINE.

THROUGHOUT its history the Lister Institute has never ceased to take an active share in elucidating problems of vital importance in tropical disease. It has been enabled to do so, not so much by the despatch of scientific experts to tropical regions, though this form of activity has by no means been ignored when the necessary funds permitted, as by providing facilities for systematic research, both static and experimental, in those basal sciences protozoology, entomology, bacteriology, experimental pathology, and biochemistry, &c., which determine more and more, as time goes on, the lines of solid advance.

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(4) *Physical Education and Hygiene.*—The last quinquennial report stated that "the weak point about physical education is that those who stand most in need of physical culture get least of it." This state of affairs is passing away; all inspectors report on the advance made during the last five years. Scout troops have only been really organised in Madras since 1917, but by 1920 there were 280 scout troops and packs with a total of 500 officers and over 6000 scouts. In 1921 Government approved a new syllabus on hygiene for Forms I. to III.; this syllabus was translated into the principal vernaculars, and was adopted in all middle and secondary schools.

Beri-beri in Madras Presidency.

In 1918–20 Colonel R. McCarrison, I.M.S., at the instance of the Indian Research Fund Association, undertook an investigation into beri-beri. As a result of his inquiries it was found that in Madras Presidency the disease is confined to a narrow tract on the east coast comprising the districts of Ganjam, Vizagapatam, Godaveri, Kistna, Guntur, and Nellore. No cases of beri-beri have been reported from districts lying outside this strip of coast except for a few in Vellore and in Bellary Jail. The disease attains its maximum degree of endemicity in the Kistna district, lying between the Kistna and Godaveri rivers, and is particularly prevalent in the neighbourhood of the left bank of the Kistna. At the Fourth Congress of the Far Eastern Association of Tropical Medicine held in 1921 it was recommended that governments concerned should take action to discourage the case of milled rice which contains less than the standard minimum of four-tenths of 1 per cent. of P_2O_5. The Congress also recommended the appointment of a commission, to which each country would be asked to send a delegate, which would make recommendations as to the best methods of bringing beri-beri under control. Colonel McCarrison considered that the provinces of Madras, Burma, and Bengal were sufficiently affected to require legislation; in anticipation of such action a brief memorandum on the subject of the causes of beri-beri has been prepared by him in consultation with the Director of Public Health, and this has recently been issued by the Government of Madras for propaganda purposes, translations having been made into the local vernaculars of the districts affected. Legislation for milled rice may be impracticable under present conditions, and it seems more reasonable to diffuse knowledge of the disease and its prevention than to interfere with mill-owners and their machinery.

Chemical Examiner's Report for 1922.

Major C. Newcomb's report as usual contains a number of interesting details. The total number of cases and articles examined was 3824 against 3952 in 1921. Human poisoning cases numbered 220, and stain cases 399. He says:—

"The regularity throughout the year with which the murder cases are sent to us is striking. One would expect, I think, some seasonal variation in their numbers or some indication of the 'waves of crime' of which one reads from time to time in the newspapers. . . . So far as the statistics of this department show, there is no murder season in the Madras Presidency, and waves of crime if they exist must be very choppy ones."

Of the 220 cases of suspected human poisoning, 108 showed poison, giving a positive percentage of 49·1 as compared with 40·6 in 1921. The chemical examiner, however, regrets in this connexion that more time is not available for experimental use of new toxicological methods. Of the 108 human cases in which poison was detected, mercury was found in 32 cases, arsenic in 29, and opium in 19. Of the less common poisons two were cases of cyanide, one of iodine, one of caustic soda, one of "phenyle" and one of quinine and ergot. In four cases an unrecognisable alkaloid was extracted from the viscera. In cases of animal poisoning, arsenic was the most commonly found poison, theretin, the active principle of yellow oleander, being next common. The number of cases totalled 42. Of medico-legal cases there were 27 against 21 in the previous year. Two were concerned with the identification of supposed murdered persons from bones which had been discovered. The Chemical Examiner doubts whether, in such cases, it is possible to estimate the height of the person within three inches.

"A case of some interest occurred in which the identity of some hairs was required. A woman was found murdered and grasped in her hand a tuft of hair which she presumably had pulled out of the murderer's head in the struggle which had taken place. A man was arrested on suspicion of having committed the murder and the tuft of hair found with the body and samples of the accused's hair were forwarded to us for an opinion as to whether they were the same. A microscopic examination of the broken ends of the hair found in the corpse's hand showed that the hair had been pulled out and not cut. Although to the naked eye one of the hairs seemed rather more curly, under the microscope, mounted in potash solution, they seemed identical, and to investigate the point further, as curliness is associated with oval cross-section, the two hairs were mounted in paraffin and cross-sections cut for me by the professor of pathology. No differences in the shape of the cross-sections could be found."

This case is still proceeding.

Madras, June 5th.

CZECHO-SLOVAKIA.

(FROM OUR OWN CORRESPONDENT.)

Medical Fees and Improved Cost of Living.

THE Ministry of Health has issued a decree addressed to the Chambers of Physicians urging the cutting down of medical fees in accordance with the downward tendency of all prices in the Republic. The Ministry calls attention to the undeniable fall in the prices of food, raw materials, and other articles, and indicates that the medical profession should adapt its fees to this general tendency if the deflation policy of the Government is to succeed. The Chambers of Physicians are asked to take the necessary steps in coöperation with other medical organisations, and report the result to the Ministry as soon as possible. This decree will not arouse much enthusiasm amongst the medical profession; physicians argue that their fees did not keep step with prices in general when the latter were going up, and that, therefore, the present medical fees are still comparatively much below other prices. The price index of medical fees is stated to be at present only 50 per cent. of the index for the average cost of living. In spite of this fact, insurance association fees have already been cut down by 10-15 per cent., and private fees have also automatically declined under pressure of the general economic situation.

Prof. C. Chodounsky.

Prof. Charles Chodounsky recently celebrated his eightieth birthday. He is one of the oldest active physicians in the Republic, and probably the last living pupil of the famous J. E. Purkinje. Chodounsky served as Purkinje's private assistant for a year whilst studying at the University of Prague. After graduation he was forced by financial difficulties to take up private practice, although his real interest lay in research. He found means, however, of carrying on private experimental work, and was also prominent in the work of various medical organisations, being for long the moving spirit of the Scientific Association of Czech Physicians. In 1884 he became associate in balneotherapy in the medical faculty at Prague, and in 1888 he began to lecture also on pharmacology, which then became his chief object of study. In 1890 he

MEDICINE AND THE LAW.

HOUSE-LETTING AND INFECTION: COLLINS *v.* HOPKINS.

IN this important case the question at issue was the extent of the implied warranty by the lessor of a furnished house that it is reasonably fit for the lessee to inhabit, where there has been a case of infectious disease in the house shortly before the lessee's occupation, and with regard to the case before the court, where the disease is pulmonary tuberculosis. Mr. B. M. Collins sued Mrs. E. Hopkins, a widow, for damages for breach of an implied warranty, in letting to him a furnished house at St. Albans, that the house was reasonably fit for habitation. The plaintiff's case was that it was not so fit because the defendant's husband when suffering from pulmonary tuberculosis was living in the house until six weeks before the plaintiff was to occupy it. There was a further alleged ground of claim, that the defendant's agents had expressly warranted that Mr. Hopkins was not suffering from consumption, but Mr. Justice McCardie, in his judgment, dealt only with the first point, and the agents denied having made the statements attributed to them.

In February, 1922, Mr. Hopkins was found to be suffering from tuberculosis. He was treated in a sanatorium, but was at home in July and again at the end of August till Sept. 11th, when he went to Switzerland, where he died in December. The agreement to let was made on Oct. 14th, the tenant's occupancy to begin on Oct. 26th. The plaintiff heard of the nature of Mr. Hopkins's illness on the day after he entered the house, and at once repudiated the agreement and left it. He claimed damages, including the return of a first instalment of rent (£88).

Medical evidence for the plaintiff was given by Dr. W. J. Fenton, who said that it would not be safe to take a furnished house as described, unless there had been thorough disinfection of walls and floors and fumigation under skilled supervision by the medical officer of health. In cross-examination he admitted that he knew of no case of infection proved to have arisen from the presence of a person suffering from tuberculosis in a house six weeks before a second person inhabited it. For the defence Dr. S. Vere Pearson, who had treated Mr. Hopkins at Mundesley Sanatorium, described his case, and expressed the opinion that there was no risk in the plaintiff occupying the house on Oct. 26th. He had never heard of infection in such circumstances as those described, and said that there was no recorded instance of tuberculous infection taking place in premises which an affected person had lived in and left. Dr. E. H. Lipscomb described his treatment of Mr. Hopkins at St. Albans. He had omitted to notify the case, and had not thought it necessary that the house should be fumigated. Dr. A. L. Punch was of opinion that there would have been no danger, as in the circumstances described the life of the bacillus would not have been more than a week or two. Evidence was given by the defendant and the agent who let the house.

Mr. Justice McCardie, in a considered judgment, reviewed the law relating to the subject, and had no doubt that "an appreciable measure of actual risk justifies the tenant in throwing up his contract. A man should not be called on to expose his wife and children or himself to peril." Among the matters to be considered were the nature of the disease, the degree and persistence of its infectivity, the date when the sufferer lived in the house, and the steps taken to prevent infection. In dealing with the case before him his lordship referred to the defendant as an unsatisfactory witness, who had admitted that if she had been asked what was the matter with her husband she would have answered "slight lung trouble only," and he was of opinion that the house had been left in a very dirty state for the plaintiff to go into. He also referred to the deceased as having gone to the city and about his ordinary business when warned that he might infect others. He referred to Dr. Lipscomb's evidence as to his not having notified the disease through an oversight, and regretted that no medical man should have supervised the disinfection of a house about to be let furnished.

His lordship's final summing up of his own conclusions indicate his application of the law to the facts of the particular case: (1) "I am not satisfied that the house and its contents were free from tubercle bacilli on Oct. 26th, 1922; (2) I am satisfied that there was a substantial risk that the house and its contents were so infected with bacilli on Oct. 26th as to constitute an actual danger to the plaintiff and his household; (3) while recognising the difficulties of inference on the point I should hold, if necessary, that in fact the house and its contents were so infected with tubercle bacilli on Oct. 26th as to render it unsafe for occupation. I therefore rule that it was not reasonably fit for habitation. It follows that the plaintiff was entitled to renounce the tenancy and quit the house; also that he is entitled to damages." His lordship accordingly gave judgment for the plaintiff for £130 with costs.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Education in Madras Presidency, 1917–1922.

THE report of the Director of Public Instruction for the five years ending March 31st, 1922, on the state and progress of education in Madras Presidency has recently been issued by Government. Among the items of importance to the medical profession are the following:—

(1) *Medical Inspection of School Children.*—In 1920 a system of grants-in-aid for medical inspection in aided and public schools was introduced, and over 200 schools were inspected by approved medical officers and participated in the general scheme for grants-in-aid for this work. It was originally proposed to appoint three sub-assistant surgeons to inspect Government schools and to correlate and direct the work of the other medical inspectors, but this scheme has been held in abeyance. Inspection has not yet been conducted in accordance with settled principles, universally applied; but there can be no doubt as to the urgent necessity for such inspection. Several aided secondary schools appointed medical inspectors and received grants, and some other schools, though not receiving Government grants, conducted medical inspections. So far no medical inspection has been undertaken in Government schools.

(2) *Medical College.*—The subordinate teaching staff of the Medical College has been reorganised and the system under which certain assistant surgeons were detailed for college work and given no hospital duties, while those attached to the hospitals and assisting in imparting clinical instruction to students were not given any teaching allowance, was discontinued; all assistant surgeons actually engaged in instruction, whether in the College or in the hospitals, were appointed assistants to the professors concerned and given hospital as well as teaching work and uniform rates of allowances. In February, 1920, the Government of Madras sanctioned the proposal to institute a course of training for six months in dental surgery for civil assistant surgeons and senior sub-assistant surgeons not exceeding five at a time. The first course was held in 1920 and proved a success. Post-graduate courses for civil assistant surgeons were also begun in 1920. In December, 1921, the Government of Madras directed that the students of the College should be trained in squad, company, and physical drill during their third year, and in stretcher drill and first-aid during their fourth year.

(3) *Medical Schools.*—The medical schools at Calicut, Vizagapatam, Tanjore, and Rayapuram worked throughout the period under review. In July, 1918, a new school was opened at Madura with

a staff of one superintendent and four lecturers. The strength of the schools has continued to increase. During the years 1917 to 1922 the strength of the Rayapuram school increased from 310 to 569 and that of the Tanjore school from 148 to 276. The total strength of schools in 1921 was 1262 as against 662 in 1917. Accommodation and equipment are generally unsatisfactory: the provision of hostels has become an urgent necessity for all the schools.

(4) *Physical Education and Hygiene.*—The last quinquennial report stated that "the weak point about physical education is that those who stand most in need of physical culture get least of it." This state of affairs is passing away; all inspectors report on the advance made during the last five years. Scout troops have only been really organised in Madras since 1917, but by 1920 there were 280 scout troops and packs with a total of 500 officers and over 6000 scouts. In 1921 Government approved a new syllabus on hygiene for Forms I. to III.; this syllabus was translated into the principal vernaculars, and was adopted in all middle and secondary schools.

Beri-beri in Madras Presidency.

In 1918–20 Colonel R. McCarrison, I.M.S., at the instance of the Indian Research Fund Association, undertook an investigation into beri-beri. As a result of his inquiries it was found that in Madras Presidency the disease is confined to a narrow tract on the east coast comprising the districts of Ganjam, Vizagapatam, Godaveri, Kistna, Guntur, and Nellore. No cases of beri-beri have been reported from districts lying outside this strip of coast except for a few in Vellore and in Bellary Jail. The disease attains its maximum degree of endemicity in the Kistna district, lying between the Kistna and Godaveri rivers, and is particularly prevalent in the neighbourhood of the left bank of the Kistna. At the Fourth Congress of the Far Eastern Association of Tropical Medicine held in 1921 it was recommended that governments concerned should take action to discourage the case of milled rice which contains less than the standard minimum of four-tenths of 1 per cent. of P_2O_5. The Congress also recommended the appointment of a commission, to which each country would be asked to send a delegate, which would make recommendations as to the best methods of bringing beri-beri under control. Colonel McCarrison considered that the provinces of Madras, Burma, and Bengal were sufficiently affected to require legislation; in anticipation of such action a brief memorandum on the subject of the causes of beri-beri has been prepared by him in consultation with the Director of Public Health, and this has recently been issued by the Government of Madras for propaganda purposes, translations having been made into the local vernaculars of the districts affected. Legislation for milled rice may be impracticable under present conditions, and it seems more reasonable to diffuse knowledge of the disease and its prevention than to interfere with mill-owners and their machinery.

Chemical Examiner's Report for 1922.

Major C. Newcomb's report as usual contains a number of interesting details. The total number of cases and articles examined was 3824 against 3952 in 1921. Human poisoning cases numbered 220, and stain cases 399. He says:—

> "The regularity throughout the year with which the murder cases are sent to us is striking. One would expect, I think, some seasonal variation in their numbers or some indication of the 'waves of crime' of which one reads from time to time in the newspapers. . . . So far as the statistics of this department show, there is no murder season in the Madras Presidency, and waves of crime if they exist must be very choppy ones."

Of the 220 cases of suspected human poisoning, 108 showed poison, giving a positive percentage of 49·1 as compared with 40·6 in 1921. The chemical examiner, however, regrets in this connexion that more time is not available for experimental use of new toxicological methods. Of the 108 human cases in which poison was detected, mercury was found in 32 cases, arsenic in 29, and opium in 19. Of the less common poisons two were cases of cyanide, one of iodine, one of caustic soda, one of "phenyle" and one of quinine and ergot. In four cases an unrecognisable alkaloid was extracted from the viscera. In cases of animal poisoning, arsenic was the most commonly found poison, theretin, the active principle of yellow oleander, being next common. The number of cases totalled 42. Of medico-legal cases there were 27 against 21 in the previous year. Two were concerned with the identification of supposed murdered persons from bones which had been discovered. The Chemical Examiner doubts whether, in such cases, it is possible to estimate the height of the person within three inches.

> "A case of some interest occurred in which the identity of some hairs was required. A woman was found murdered and grasped in her hand a tuft of hair which she presumably had pulled out of the murderer's head in the struggle which had taken place. A man was arrested on suspicion of having committed the murder and the tuft of hair found with the body and samples of the accused's hair were forwarded to us for an opinion as to whether they were the same. A microscopic examination of the broken ends of the hair found in the corpse's hand showed that the hair had been pulled out and not cut. Although to the naked eye one of the hairs seemed rather more curly, under the microscope, mounted in potash solution, they seemed identical, and to investigate the point further, as curliness is associated with oval cross-section, the two hairs were mounted in paraffin and cross-sections cut for me by the professor of pathology. No differences in the shape of the cross-sections could be found."

This case is still proceeding.

Madras, June 5th.

CZECHO-SLOVAKIA.

(FROM OUR OWN CORRESPONDENT.)

Medical Fees and Improved Cost of Living.

THE Ministry of Health has issued a decree addressed to the Chambers of Physicians urging the cutting down of medical fees in accordance with the downward tendency of all prices in the Republic. The Ministry calls attention to the undeniable fall in the prices of food, raw materials, and other articles, and indicates that the medical profession should adapt its fees to this general tendency if the deflation policy of the Government is to succeed. The Chambers of Physicians are asked to take the necessary steps in coöperation with other medical organisations, and report the result to the Ministry as soon as possible. This decree will not arouse much enthusiasm amongst the medical profession; physicians argue that their fees did not keep step with prices in general when the latter were going up, and that, therefore, the present medical fees are still comparatively much below other prices. The price index of medical fees is stated to be at present only 50 per cent. of the index for the average cost of living. In spite of this fact, insurance association fees have already been cut down by 10-15 per cent., and private fees have also automatically declined under pressure of the general economic situation.

Prof. C. Chodounsky.

Prof. Charles Chodounsky recently celebrated his eightieth birthday. He is one of the oldest active physicians in the Republic, and probably the last living pupil of the famous J. E. Purkinje. Chodounsky served as Purkinje's private assistant for a year whilst studying at the University of Prague. After graduation he was forced by financial difficulties to take up private practice, although his real interest lay in research. He found means, however, of carrying on private experimental work, and was also prominent in the work of various medical organisations, being for long the moving spirit of the Scientific Association of Czech Physicians. In 1884 he became associate in balneotherapy in the medical faculty at Prague, and in 1888 he began to lecture also on pharmacology, which then became his chief object of study. In 1890 he published his "Theoretical Pharmacology," in 1896 a "Programme of Toxicology," and in 1920 a "Text-book of Pharmacology." He also published a great number of lesser studies on different problems of pharmacology, and a long series of popular articles on public health topics. He is one of the founders of Czech medical terminology. Formerly a distinguished Alpinist and sportsman, Prof. Chodounsky retains excellent health, and although he had retired from University work shortly before the war, he went to Brno (Brünn) when the new medical faculty was created there after the establishment of the Czecho-Slovak Republic, and organised the institute of pharmacology, materially assisting in the organisation of the whole faculty, and remaining at the head of the institute until he had trained his successor. He has now entered honourable retirement for the second time.

First Czecho-Slovak Tuberculosis Congress.

In May took place the first Czecho-Slovak National Congress against Tuberculosis, organised by the Society for Research in Tuberculosis, and preceded by the annual meeting of the Masaryk Antituberculosis League. There were over 350 medical men present, and 120 papers were read. The three sessions of the Congress were devoted to clinical and theoretical questions, social problems, and veterinary problems respectively. Important resolutions were adopted based largely on papers read at the Congress, and relating to the creation of special institutes for research and instruction, to the establishment in general hospitals of pavilions for advanced cases of tuberculosis in order to relieve the pressure upon sanatoriums, and to compulsory medical examination of persons who want to marry. The importance of popular public health education, especially for children, was also emphasised, and the Government was asked to study the question of the early immunisation of children. School hygiene, housing and factory inspection, and Government support of necessitous tuberculous persons were also the subjects of resolutions, together with inspection of meat and milk, and the appointment of a permanent committee for the study of tuberculosis in cattle.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

The following are the principal health statistics of a number of towns and urban districts for the year 1922:—

Name of town.	Estimated population (mid-year).	Birth-rate.	Death-rates per 1000 of population. All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Death-rates per 1000 births. Infant mortality. Legit.	Illegit.	Maternal mort. in childbirth.
Coventry C. ..	129,000	18·9	10·6	1·2	1·0	2·2	70	78	2·5
Grimsby C.B. ..	83,600	24·0	13·1	1·4	1·3	2·6	91	124	3·5
Eastbourne C.B.	53,700	13·7	10·9	0·7	1·6	1·8	45	37	—
Colchester B. ..	43,740	18·0	11·9	1·1	1·4	1·2	60	79	1·3
Poole B.	43,250	20·0	14·4	1·5	1·4	2·3	77	132	4·6
Swindon B. ..	55,680	19·0	12·2	1·3	1·0	2·8	58	122	0·9
Maidstone B. ..	38,300	18·0	11·1	1·0	—	—	53	114	2·9
Hyde B.	34,100	16·5	12·7	1·1	1·3	3·0	65	33	0·0
Barry U.D. ..	39,310	23·6	11·6	1·1	0·9	2·6	84	94	3·2
Beckenham U.D.	33,160	16·0	10·7	0·8	1·5	2·6	55	50	0·0

C. = city. C.B. = county borough. B. = borough. U.D. = urban district.

Coventry.

Dr. E. H. Snell submits a table showing that the mean age at death has gradually increased from 35·1 in 1895 to 45·4 in 1922; a chart showing that since 1881 the birth-rate has come down from the neighbourhood of 35 to about 20, and the death-rate from 20 to 10; and another chart showing the drop in infantile mortality in the present century from 150 to 70. Attention is drawn to the need for covering the Spon End tank, through which passes about one-third of the city's water-supply. The housing question is still urgent. Houses closed before the war have had to be reopened and remain occupied; only gross cases of overcrowding can be dealt with, and Dr. Snell gives the details of 10 very gross cases. He also refers to the lessening frequency of rickets in the out-patient rooms of large hospitals. Of 28 notified cases of ophthalmia neonatorum, 25 made complete recoveries, 2 partial recoveries, and 1 is totally blind.

The school dentists think that the practice of charging a shilling fee for dental treatment is an obstacle. Only 1660 children out of 3338 referred for treatment actually received treatment. The total fees paid in 1922 only amounted to £68. The Corley Camp open-air school for 16 children did good service. Dr. A. H. Newton mentions the case of two of the children, who continually suffered from colds and bronchitis at home, and spent the summer at the camp, going about without shoes and stockings, without a suspicion of colds or bronchitis. The open-air class at Centaur-road school also did well. Miss E. K. Brown, the organiser of physical training, gives an interesting report of her work. She now has 52 elementary schools, one special school, and two open-air classes under her supervision. A daily physical training lesson and deep-breathing exercises in the fresh air, folk-dancing, and organised games are some of the features. Special attention is given to swimming; at the swimming gala 23 first-class certificates were awarded to girls and only 5 to boys. Miss Brown finds a great deal of mouth-breathing is simply due to long-standing neglect to use a handkerchief effectively.

Dr. Newton reports unfavourably on the way meals are supplied at the municipal restaurant. He thinks there might be more variety, more green vegetables, and more fat, but he is chiefly concerned about the service. A plateful of each course is put out on the table ready for each child coming in. The child finishes the meal in just over five minutes. One is not surprised, therefore, to hear that there have been statements from parents that the meals make the children sick. The only cutlery supplied is one spoon for both courses. Such meals can hardly be called educational in table manners.

Grimsby.

Dr. B. C. Stevens reports among the needs of Grimsby—provision for advanced consumptives (the borough already owns the site on which to build a 30-bed hospital), a maternity home, and an infants' hospital. The V.D. clinic, which has been removed from the Grimsby and District Hospital to more commodious premises in Queen-street, is proving increasingly useful. It is coöperating well with the ante-natal clinic and being used by seamen in a satisfactory manner. Dr. Stevens emphasises the need for the better protection of food from contamination, and especially advocates the wrapping of bread in waxed paper before it leaves the bakery, a method which has the additional advantage of keeping the loaf fresh. He also draws attention to the present dirty methods of handling meat, and points out that imported meat is better protected than the home product.

Eastbourne.

Dr. W. G. Willoughby points out that the most serious adverse factor in public health matters is the want of adequate housing accommodation. "Private enterprise in building, seriously injured by well-meant but pernicious legislation in 1907–10, was finished off by the war. Municipal housing is a necessity because the private owner does not like families with children and does not mind if a good tenant is an old resident of Eastbourne or not. In letting municipal houses preference is given to large families, and length of residence in Eastbourne and war service are taken into consideration. Apart from non-residents, families without children, and families with fair accommodation, there are about 400 families needing houses. This number includes families in hut tenements, which ought to be abandoned as soon as possible." Of the four genuine cases of enteric fever notified, three are said to have acquired the infection elsewhere. A fifth notified case, proved to be acute miliary tuberculosis, gave a positive Widal reaction, evidently the result of inoculation during the war.

At the tuberculosis dispensary Dr. W. Muir Smith continues to use tuberculin in selected cases with satisfactory results. The municipal midwife, who acts as a health visitor when not engaged in obstetrical work, attended 52 confinements. The full fee, 25*s*., for her services was paid in 39 cases. Eleven mothers were provided with dentures, eight free of cost.

Colchester.

Dr. W. F. Corfield draws attention to the decline in tuberculosis and the increase in cancer. He again points out the pressing need for more houses, and states that habitations are still in use that should not be tolerated. There is a small revival of private building. An outbreak of diphtheria at the Essex County Hospital was promptly stamped out by "swabbing" and the isolation of 12 positive contacts, over and above the 13 cases of the disease. The long-tubed bottle, after a short return to Colchester, has again been suppressed, and Dr. Corfield would like to see it prohibited by law.

Poole.

Dr. R. J. Maule Horne tells us there are signs that Poole is coming into its own as one of the most picturesque health-resorts on the South Coast, and that for natural beauty its harbour stands comparison with Sydney or Rio de Janeiro. The water is purified by chlorination and additional pumping is being installed as a safeguard against a very dry season. Cesspools are being gradually replaced by sewers; a table shows that there were still 379 in existence last year. Dr. Horne wants a modern refuse plant and condemns the three tips as uneconomical and bad public health. "Fires, fumes, flies, fungi, and four-footed fomites are the legacy." Of the 145 new houses completed during the year, 100 are occupied by new residents, so that little has been done to relieve the shortage in the congested districts. During Health Week oral sepsis was wisely chosen as the special theme.

Swindon.

Dr. Dunstan Brewer reports that influenza, as in other towns, was epidemic in the beginning of the year. A severe form of whooping-cough, with pneumonia as a common complication, was also prevalent at the same period. The mortality, owing to overcrowding, was very high among the home-treated cases, and in future an endeavour will be made to provide accommodation for such cases in the fever hospital. The opening of the maternity home in July and the establishment thereat of an ante-natal clinic has supplied a long recognised need. Anxiety as to the water-supply was relieved by the wet summer, and in the meantime progress with the new adits at Ogbourne has provided for the future.

The corporation have completed 90 new houses outside the borough and private enterprise 24 within, but this has not relieved overcrowding, when the natural increase of the population is taken into consideration. Nevertheless, as the report of the sanitary inspector puts it, the outlook in Swindon is much better than in some towns. Dr. Brewer considers that the class which has suffered most is that of newly married couples in moderate circumstances. The majority of first babies are born to couples living in rooms, frequently in a single room. Families, as they increase in size, cannot move to larger houses, as formerly. Swindon's most urgent need is a hospital of about 150 beds for surgical and medical cases. The present accommodation is a private 12-bed hospital belonging to the G.W.R. Medical Fund Society, and a 32-bed cottage hospital. Swindon has grown very rapidly and used to depend upon the London hospitals.

Maidstone.

Dr. C. P. Oliver reports no extraordinary causes of sickness or invalidity during the year. Analytical reports of the water have been satisfactory. The gathering-grounds and reservoirs continue to be patrolled daily by an employee of the Water Company, and have been inspected by Dr. Oliver in company with Prof. J. Eyre, Dr. A. Greenwood (County M.O.H.), and Mr. Ware, the engineer, and invariably found to be in a satisfactory condition.

Hyde.

Dr. Nicolas Gebbie, who took over the duties of M.O.H. from Dr. J. Bennett on Feb. 6th, 1922, reports that except for an outbreak of measles in the summer the borough has been fairly free from infectious diseases. Only about 20 per cent. of the sanitary conveniences are w.c.'s with cistern flush, 65 per cent. being w.c.'s with hand or waste-water flush, and 15 per cent. pails or privy middens. The 1500 ashpits in the borough create a serious nuisance. Warnings have been issued with regard to smoke from factory chimneys, but no prosecutions were undertaken.

Overcrowding is serious, and in some parts of the borough there are three and four families living in a four-roomed cottage. Indiscriminate mixing of the sexes at all ages results. "Under these circumstances," says Dr. Gebbie, "we cannot hope for a strong race, physically, mentally, or morally." One of the pavilions at the new fever hospital forms part of the county tuberculosis scheme, and admits advanced cases of consumption. Owing to unemployment, fewer mothers have been working at the mills, and Dr. Gebbie thinks the loss to the family income was more than compensated for by the greater care taken of the children and the increased facilities for breast-feeding.

Barry Urban District and Port.

Dr. Percy W. Kent describes the small outbreak of small-pox which occurred in Barry in 1922. Two sailors, feeling ill, left their ship in London and arrived in Barry on the morning of Oct. 5th. (During the voyage there had been two seamen down with illnesses diagnosed as chicken-pox.) One of the sailors infected an unvaccinated boy, aged 4 years, who was notified as small-pox and died from a confluent attack. The notification was followed by the discovery that both sailors and the aunt of the boy were suffering from modified small-pox. All three had been vaccinated in infancy, and one of them revaccinated at 14 years of age. Prompt measures were taken as to the supervision and vaccination of contacts, and no further case occurred. Subsequently the captain of the ship was summoned by the London Port Sanitary Authority for giving incomplete information and fined £50. Another case of small-pox arrived in the port from Lisbon in July, and was removed to the small-pox hospital.

The urban district council manages an accident and surgical hospital, with a medical staff consisting of the M.O.H. as superintendent, a surgeon, three assistant surgeons, and a radiographer. Dr. G. H. Winch, the V.D. medical officer, states that the clinic, opened in October, 1921, in the same building as the maternity and child welfare and school clinics, is ideally situated, that the patients are keen and regular in their attendance, and that a large number of seamen are treated. In his opinion provision for the treatment of seamen is, as a rule, not properly organised. Dr. Kent gives evidence to show that the water-supply is not safe, and this matter is receiving the careful attention of the council.

Beckenham Urban District.

Dr. J. M. Clements reports that the urban districts of Beckenham and Penge have provided a joint maternity home, the midwives from which attend some extern cases, while an arrangement has been made with the two certified midwives practising in the district to attend other extern cases. In addition to these two midwives there are a number of unqualified persons who go out as monthly nurses under the supervision of doctors in charge of the cases. Dr. Clements is anxious for a more precise definition of the degree of supervision to be given by the doctor in charge of such cases. He also complains of the unsatisfactory arrangement by which the district council has everything to do for mothers and infants except the supervision of the midwives, which is carried out by the county council, although the work of the midwives is indissolubly bound up with the whole scheme of maternity and child welfare.

The school clinic needs extension, partly for the purpose of housing the dental clinic under the same roof. The school dentist, Mr. Robert A. Waters, shows that of 2298 children referred for treatment, 1788, or 78 per cent., were actually treated. Of the remaining 22 per cent., 18 refused treatment, two failed to keep appointments, and two said they would get private treatment, but generally failed to do so. The 18 per cent. definite refusals were sometimes due to the attitude of the parents, sometimes to the attitude of the older children, who refuse to attend even at the wish of their parents.

SCHOOL MEDICAL SERVICE.

Derbyshire.

During the year 26,744 children were medically examined, 26,389 of these coming under the routine age-groups. Of the latter 6702 were referred for treatment, and during the year 2505 children received treatment for eye trouble and 3605 for ear disease. Operations for diseased tonsils and adenoids were performed upon 1155 children; these are excluded from school for two weeks after operation. 151 cases of ringworm were treated by means of X rays; 19,936 dental extractions and 13,526 dental fillings were performed. Dr. Sidney Barwise demonstrates that the young boys and girls in Derbyshire are taller and heavier than the average of the same class in England and Wales, but in the later ages the advantage is not maintained. Examination of the secondary school children reveals the fact that postural deformities with the exception of flat-foot are much less common in boys than in girls. Of 816 boys examined, 54 had some degree of flat-foot; 2 per cent. had colour-blindness. Of 1803 girls examined in the secondary schools 270 had enlarged or septic tonsils and adenoids. Goitre was present in 194. In the more marked cases it was fairly easy to persuade the parents to have the condition treated, but in far too many of the milder cases it is still regarded as just Derbyshire neck, something that runs in the family. Tables are given showing the personal equation of the doctor in discovering and recording defects; the percentage of children referred for all conditions varying in different doctors' districts from 33·6 to 11·5 per cent. During the year 861 children were excluded from school, 105 because they were verminous, 755 for medical reasons, 287 of these being on account of tuberculosis. There were 17 permanent exclusions from school, 7 of them being on account of mental condition, 2 for epilepsy, and 2 for defective vision. Dr. Mary Gallagher gives the results of 983 cases of enlarged tonsils and adenoids upon which she operated. In one half of these cases the condition had caused secondary complications such as suppurating middle-ear disease or chronic catarrh of the middle ear with deafness, chronic inflammation and discharge from the nose. In a considerable number of cases operation had to be deferred owing to treatment for anæmia, septic teeth, &c., having to be carried out. In one case the child had to be treated for six months before she was fit for operation. Of the 983 cases operated on, 890, or 90 per cent., were discharged cured and 83 improved. In ten cases there was no improvement. In several cases operations were performed on children who had already been operated on with the guillotine—that is, a piece of the tonsil had been sliced off—and after a short time the symptoms had unfortunately recurred. Dr. Gallagher states that the cardiac condition of 30 children was such that the operation was performed without an anæsthetic. We should consider it doubtful, however, whether such a procedure would be likely to do less damage than an operation under carefully administered anæsthesia.

The school dentist submits an interesting report. He finds that 80 per cent. of the children inspected were referred for treatment, and 20 per cent. actually treated. He insists that any propaganda for the prevention of caries in children must depend on the teachers.

The Services.

ROYAL ARMY MEDICAL CORPS.

An examination for not fewer than 20 commissions in the Royal Army Medical Corps will be held in London on August 1st. Those who intend to compete should lodge their applications with the Secretary of the War Office not later than July 20th. The presence of candidates will be required in London from July 30th. A full statement of the duties and emoluments of the service will be furnished to prospective candidates on written application to the Secretary (A.M.D.1), War Office, Whitehall, S.W. 1.

Maj. A. H. Bond, *from the half-pay list, is restored to the* estbt.

Capt. R. Stowers retires, receiving a gratuity.

Capt. K. Masson retires on account of ill-health.

Temp. Hon. Maj. J. L. Dickie relinquishes his commn. and retains the hon. rank of Maj.

Temp. Capt. D. S. Taylor relinquishes the acting rank of Maj.

The undermentioned *temp. Capts. relinquish* their commissions and *retain the rank* of Capt.: T. A. Rothwell, S. Herbert (on account of ill-health contracted on active service), and W. J. E. Stuttaford.

TERRITORIAL ARMY.

Capt. H. J. Davidson retires, receiving a gratuity.

General List: Maj. V. H. Wardle (late R.A.M.C., T.A.) to be Capt. and relinquishes the rank of Maj.

General Hospitals: Lt.-Col. W. E. Hume and Capt. (Bt. Maj.) R. E. Kelly relinquish their commns. and are granted the rank of Col.

Sanitary Companies: Capt. R. J. S. McDowan relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY RESERVE.

Capt. J. Derham-Reid *relinquishes his* commn. and is granted the *rank of Maj.*

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdrs. W. L. Martin and A. L. Hewitt to be Surg.-Capts.

ROYAL AIR FORCE.

Squadron Leader A. S. Glynn *to* be Wing Commander.

Flight-Lieutenants R. J. Aherne, P. H. Young, and P. T. Rutherford to be Squadron Leaders.

DEATHS IN THE SERVICES.

Surg.-General Sir Benjamin Simpson, C.B., K.C.I.E., late Surgeon-General and Sanitary Commissioner with the Government of India, died at his residence in London on June 27th. Born in 1831, he qualified with the M.R.C.S. in 1852 and graduated M.D. at Aberdeen in the following year, when he entered the Indian Medical Department. After serving as civil surgeon and on special duty in various parts of India, he was appointed guardian to the Maharajah of Kuch Behar during his visit to Europe in 1878, and in 1881 was appointed Deputy Surgeon-General with the S. Afghanistan Field Force. In 1882 he became Sanitary Commissioner to the Central Provinces, subsequently serving as Surgeon-General in the Punjab and in Bengal. He received the C.B. in 1859 and the K.C.I.E. in 1887.

HARROGATE SPA: NEW FACILITIES OF TRAVEL.

At the invitation of the Mayor and Corporation a number of medical men, including representatives of the *British Medical Journal* and of *The Lancet*, paid a week-end visit to Harrogate on June 30th and July 1st. The occasion was the inauguration of a new Pullman Car service, arranged jointly by the London and North-Eastern Railway Company and the Pullman Car Company, Ltd. The new service of trains is to commence on Monday, July 9th, making the journey from King's Cross to Harrogate, or vice versa, in precisely four hours, with a non-stop run between London and Leeds. Each train will consist of two first-class and four third-class specially-built cars, comfortably furnished and tastefully decorated, with arrangements for serving meals to 180 passengers during the journey and adequate lavatory accommodation. Judging by the trial trip, in which many important railway officials took part, the facilities provided leave nothing to be desired.

The medical men making up the party were as follows: Dr. John Adams, Dr. L. D. Bailey, Dr. D. M. Barcroft, Dr. W. Langdon Brown, Sir Bruce Bruce-Porter, Dr. A. G. Buchanan, Dr. H. S. Buchanan, Dr. A. T. Davies, Dr. Henry Dutch, Dr. H. A. Ellis, Dr. R. Fortescue Fox, Dr. E. P. Furber, Dr. A. T. Bulkeley Gavin, Dr. Philip Hamill, Dr. W. D. Kirkwood, Dr. H. Moreland McCrea, Dr. B. Myers, Dr. H. H. Sanguinetti, Dr. W. M. Crawford Watson, Dr. Arthur Westerman, Dr. E. C. Young.

On Saturday afternoon a visit was paid to the Royal Bath Hospital and Ransom Convalescent Home, which is designed for patients unable to afford private treatment in Harrogate, suffering from skin diseases, rheumatic and kindred diseases, disorders of the liver, gout, locomotor ataxy, and lead poisoning. Patients are now charged 10*s*. 6*d*. per week towards the cost of their board, unless specially exempted. Admission is on the recommendation of annual subscribers, life governors, or contributing bodies. Visitors were received by the Chairman, Mr. C. A. Rhodes, J.P., and shown round the hospital by one or other of the six physicians.

Fig. 1.—*Harrogate in Summer: the Valley Gardens.*

The visitors were entertained at the Majestic Hotel, where the Deputy Mayor presided at a public dinner on Saturday evening. "The Town of Harrogate" was proposed by Mr. R. L. Wedgwood, Chief General Manager of the L. & N. E. Railway, who spoke of the growth of Harrogate as a health resort during two generations without any glamour of historical record, and foreshadowing further improvements to come. The Deputy Mayor, Mr. Alderman J. Sheffield, having replied, the toast of "Our Guests" was proposed by Sir A. Ernest Bain, Chairman of the Wells and Baths and Publicity Committee. Sir Davison Dalziel responded for the Pullman Car Company, Dr. R. Fortescue Fox for the medical guests. Dr. Fox spoke of spas as a national asset, expressing his personal belief in the curative virtues of British waters and British climate, each spa having its own individual character and value. In the long run success would be achieved by each spa developing its own natural resources. Britain was happy in possessing the most tonic spas of the world, which would, if properly known, attract multitudes of foreigners. Utilisation of these natural products was, he said, a necessity for our present stage of civilisation, with its large floating population of tired people. He hoped soon to see the long delayed recognition of spa treatment by State and universities.

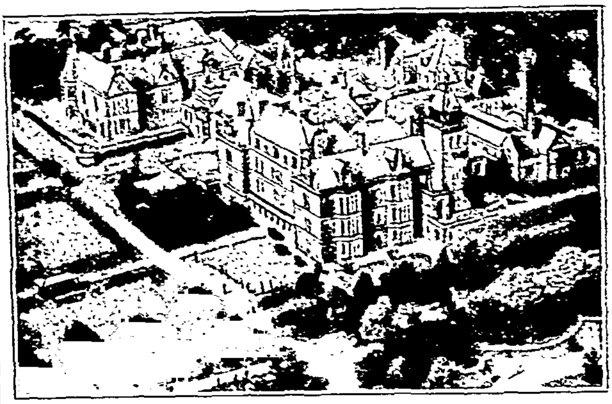

Fig. 2.—*The Royal Bath Hospital, viewed from the air.*

Dr. David Brown, speaking for the Harrogate Medical Society, emphasised four points in connexion with the treatment. In the first place, Harrogate made provision for persons of various means. For a hundred years the Royal Bath Hospital had provided 150 beds for the service of the poor, with an endowment of £2,200 a year and supported to the extent of six-sevenths by the visitor element. This hospital remained open all the year round, drew its patients from all parts of England, and treated 2000 patients annually. The honorary staff numbered 17 individuals and work of clinical importance and investigation was proceeding. He ventured to say that if patients of the rheumatic group reached them early enough, the bed-ridden cripple might be abolished altogether. In the second place, arrangements were in force to enable the "new poor" (with an income of under £600 a year) to obtain a combined and inclusive investigation of their case at a cost not exceeding 15 guineas. Thirdly, a school of balneology had been set up for bath attendants, who numbered in Harrogate over 200, no departmental instructor now being appointed who had not had a course of instruction lasting over two years. And lastly, much thought was being given to the scientific care of the baths and waters, an analytical chemist—a permanent servant of the Corporation—being concerned in working out the basal problems for the rationalisation of approved balneological measures.

The company attended a special concert at the Royal Hall on Saturday evening. On Sunday morning followed an inspection of the Royal Baths, closed to the public for the occasion, guests being asked to make personal use of any of the baths, of which 78 scheduled varieties are set out in the list of treatments for the current season. These are divided into three classes: (1) under the heading Balneological being included many varieties of saline-sulphur bath and douche, Nauheim, Turkish, Russian, and Berthollet baths, massage-douche on the Aix system, Vichy douche, peat baths and packs, and many others; (2) under the heading Accessory Treatments being included inhalation treatment, liver packs, paraffin wax baths, and remedial and mechanical exercises; while (3) Electrical Treatments comprise high frequency, cataphoresis, diathermy, and other currents.

Beckenham Urban District.

Dr. J. M. Clements reports that the urban districts of Beckenham and Penge have provided a joint maternity home, the midwives from which attend some extern cases, while an arrangement has been made with the two certified midwives practising in the district to attend other extern cases. In addition to these two midwives there are a number of unqualified persons who go out as monthly nurses under the supervision of doctors in charge of the cases. Dr. Clements is anxious for a more precise definition of the degree of supervision to be given by the doctor in charge of such cases. He also complains of the unsatisfactory arrangement by which the district council has everything to do for mothers and infants except the supervision of the midwives, which is carried out by the county council, although the work of the midwives is indissolubly bound up with the whole scheme of maternity and child welfare.

The school clinic needs extension, partly for the purpose of housing the dental clinic under the same roof. The school dentist, Mr. Robert A. Waters, shows that of 2298 children referred for treatment, 1788, or 78 per cent., were actually treated. Of the remaining 22 per cent., 18 refused treatment, two failed to keep appointments, and two said they would get private treatment, but generally failed to do so. The 18 per cent. definite refusals were sometimes due to the attitude of the parents, sometimes to the attitude of the older children, who refuse to attend even at the wish of their parents.

SCHOOL MEDICAL SERVICE.

Derbyshire.

During the year 26,744 children were medically examined, 26,389 of these coming under the routine age-groups. Of the latter 6702 were referred for treatment, and during the year 2505 children received treatment for eye trouble and 3605 for ear disease. *Operations* for diseased tonsils and adenoids were performed upon 1155 children; these are excluded from school for two weeks after operation. 151 cases of ringworm were treated by means of X rays; 19,936 dental extractions and 13,526 dental fillings were performed. Dr. Sidney Barwise demonstrates that the young boys and girls in Derbyshire are taller and heavier than the average of the same class in England and Wales, but in the later ages the advantage is not maintained. Examination of the secondary school children reveals the fact that postural deformities with the exception of flat-foot are much less common in boys than in girls. Of 816 boys examined, 54 had some degree of flat-foot; 2 per cent. had colour-blindness. Of 1803 girls examined in the secondary schools 270 had enlarged or septic tonsils and adenoids. Goitre was present in 194. In the more marked cases it was fairly easy to persuade the parents to have the condition treated, but in far too many of the milder cases it is still regarded as just Derbyshire neck, something that runs in the family. Tables are given showing the personal equation of the doctor in discovering and recording defects; the percentage of children referred for all conditions varying in different doctors' districts from 33·6 to 11·5 per cent. During the year 861 children were excluded from school, 105 because they were verminous, 755 for medical reasons, 287 of these being on account of tuberculosis. There were 17 permanent exclusions from school, 7 of them being on account of mental condition, 2 for epilepsy, and 2 for defective vision. Dr. Mary Gallagher gives the results of 983 cases of enlarged tonsils and adenoids upon which she operated. In one half of these cases the condition had caused secondary complications such as suppurating middle-ear disease or chronic catarrh of the middle ear with deafness, chronic inflammation and discharge from the nose. In a considerable number of *cases* operation had to be deferred owing to treatment for anæmia, septic teeth, &c., having to be carried out. In one case the child had to be treated for six months before she was fit for operation. Of the 983 cases operated on, 890, or 90 per cent., were discharged cured and 83 improved. In ten cases there was no improvement. In several cases operations were performed on children who had already been operated on with the guillotine—that is, a piece of the tonsil had been sliced off—and after a short time the symptoms had unfortunately recurred. Dr. Gallagher states that the cardiac condition of 30 children was such that the operation was performed without an anæsthetic. We should consider it doubtful, however, whether such a procedure would be likely to do less damage than an operation under carefully administered anæsthesia.

The school dentist submits an interesting report. He finds that 80 per cent. of the children inspected were referred for treatment, and 20 per cent. actually treated. He insists that any propaganda for the prevention of caries in children must depend on the teachers.

The Services.

ROYAL ARMY MEDICAL CORPS.

An examination for not fewer than 20 commissions in the Royal Army Medical Corps will be held in London on August 1st. Those who intend to compete should lodge their applications with the Secretary of the War Office not later than July 20th. The presence of candidates will be required in London from July 30th. A full statement of the duties and emoluments of the service will be furnished to prospective candidates on written application to the Secretary (A.M.D.1), War Office, Whitehall, S.W. 1.

Maj. A. H. Bond, from the half-pay list, is restored to the estbt.

Capt. R. Stowers retires, receiving a gratuity.

Capt. K. Masson retires on account of ill-health.

Temp. Hon. Maj. J. L. Dickie relinquishes his commn. and retains the hon. rank of Maj.

Temp. Capt. D. S. Taylor relinquishes the acting rank of Maj.

The undermentioned temp. Capts. relinquish their commissions and retain the rank of Capt.: T. A. Rothwell, S. Herbert (on account of ill-health contracted on active service), and W. J. E. Stuttaford.

TERRITORIAL ARMY.

Capt. H. J. Davidson retires, receiving a gratuity.

General List: Maj. V. H. Wardle (late R.A.M.C., T.A.) to be Capt. and relinquishes the rank of Maj.

General Hospitals: Lt.-Col. W. E. Hume and Capt. (Bt. Maj.) R. E. Kelly relinquish their commns. and are granted the rank of Col.

Sanitary Companies: Capt. R. J. S. McDowan relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY RESERVE.

Capt. J. Derham-Reid relinquishes his commn. and is granted the rank of Maj.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdrs. W. L. Martin and A. L. Hewitt to be Surg.-Capts.

ROYAL AIR FORCE.

Squadron Leader A. S. Glynn to be Wing Commander.

Flight-Lieutenants R. J. Aherne, P. H. Young, and P. T. Rutherford to be Squadron Leaders.

DEATHS IN THE SERVICES.

Surg.-General Sir Benjamin Simpson, C.B., K.C.I.E., late Sanitary Commissioner with the Government of India, died at his residence in London on June 27th. Born in 1831, he qualified with the M.R.C.S. in 1852 and graduated M.D. at Aberdeen in the following year, when he entered the Indian Medical Department. After serving as civil surgeon and on special duty in various parts of India, he was appointed guardian to the Maharajah of Kuch Behar during his visit to Europe in 1878, and in 1881 was appointed Deputy Surgeon-General with the S. Afghanistan Field Force. In 1882 he became Sanitary Commissioner to the Central Provinces, subsequently serving as Surgeon-General in the Punjab and in Bengal. He received the C.B. in 1859 and the K.C.I.E. in 1887.

of the pancreas in any case of diabetes, and also to recognise, or exclude, most of the other causes known to give rise to hyperglycæmia. Even if we limit the term diabetes mellitus to those instances in which disease of the pancreas can be shown to exist in this way however, we are still far from being able to answer the question in point with precision, although we are nearer doing so, for it would seem that the progress of the disease can be stayed, and permanent improvement be brought about, either by alimentary rest or insulin, when the hyperglycæmia is dependent entirely, or largely, upon a functional deficiency of the internal secretion of the pancreas, also that its progress, under suitable dietary restrictions, is slow when the condition arises as a result of sclerosis of the gland so that the state of the patient is analogous to that of a partly de-pancreatised dog, but that when the deficiency is brought about by an attempt to control, and compensate for, some other cause interfering with carbohydrate metabolism no treatment directed toward the pancreatic factor alone is of more than temporary benefit.

The only answer, therefore, which can at present be given to the question under discussion in my opinion, is that, since diabetes mellitus is not a disease but a symptom-complex arising from a variety of causes, each case is more or less a law unto itself, and whether it will progress or not depends upon the accuracy with which it is diagnosed and how far suitable methods of treatment are applied to the particular conditions discovered.

I am, Sir, yours faithfully,

P. J. Cammidge.

Nottingham-place, Marylebone, W., June 26th, 1923.

ETHYL CHLORIDE AS AN ANÆSTHETIC FOR MINOR OPERATIONS IN CHILDREN.

To the Editor of The Lancet.

Sir,—All anæsthetists will read with interest Mr. S. F. Rose's article on this subject in The Lancet of June 23rd. They will doubtless agree with all he says as to the anæsthetic virtues of ethyl chloride, but those who know how to administer it by the "open method" will certainly disagree with his dictum that "breathing with admixture of air is obsolete and unsatisfactory." Indeed, to many it will seem less enlightened to deprive a patient, particularly a child patient, of free oxygen and to enforce breathing to-and-fro into a closed bag, than to administer an anæsthetic with a free and unlimited supply of fresh air. Surely, this method must be safer than that in which all air is excluded, and the mind of the modern hygienist must revolt at the idea of a patient inhaling "the residue left from a previous administration." Mr. Rose acknowledges that children are not good subjects for nitrous oxide. Is not this because they bear deprivation of oxygen badly, and because, in them, this gas without oxygen quickly produces asphyxiation? Why, then, does Mr. Rose think that children will take ethyl chloride better without air than with it? Would he argue that fresh air is bad for children?

Mr. Rose confesses that the closed method has "one drawback"—viz., that "it may cause struggling and holding of the breath," and he mentions the "natural alarm" of the *patient* excited by its odour. He states that *both* the anæsthetist's hands are required to hold the *face-piece* in position—no wonder the little patient is alarmed! Contrast this with the open method, in which only a wire mask covered with domette is lightly applied, with one hand, at an angle with the bridge of the patient's nose, at first somewhat away from his *mouth*: and contrast the sudden presentation of the pungent vapour in a closed bag, with the gradual dropping of the ethyl chloride upon the mask, so that its vapour when inhaled is neither too pungent nor unpleasant. Mr. Rose also confesses to having experienced difficulties owing to—"holding the breath, laryngeal spasm, syncopal attacks, obstructed breathing, and vomiting." All these difficulties I submit are directly due to the closed method of administration, which enforces concentration of the vapour and causes holding of the breath and laryngeal spasm: while syncopal attacks and vomiting are in direct proportion to the duration of the rebreathing. The risks of overdose are great, and syncopal attacks and cessation of breathing are signs of overdose. Mr. Rose advocates abolition of the ocular reflexes, but in my view this is courting disaster, for when the corneal reflex is abolished the coughing reflex is also abolished; thus the sentinel of the larynx is put out of action and the risk is incurred of the patient being drowned in his own blood, or of his lungs being invaded by other foreign matter. I know some throat specialists who will not begin an operation for removal of tonsils and adenoids unless the patient's coughing reflex be brisk.

With the open method, on the other hand, I have not experienced these difficulties, except vomiting, and this rarely, in properly prepared cases, unless too deep an anæsthesia has been induced, or the induction of anæsthesia has been unduly delayed. For these reasons, some years ago, I abandoned the closed method in favour of the open method, and I teach my students at the hospital that the closed method should never be used when the open method is available, because it is more dangerous, *and because* it is wrong to risk unnecessarily a patient's life, for so trivial an operation as the extraction of a tooth.

I am, Sir, yours faithfully,

Harvey Hilliard.

Senior Anæsthetist and Lecturer on Anæsthetics
June 26th, 1923. at the Royal Dental Hospital.

FIBROMA OF THE OVARY.

To the Editor of The Lancet.

Sir,—Dr. A. W. Owen and Dr. H. A. Lediard have discussed a type of tumour in which I still take a great deal of interest. One matter of clinical as well as pathological importance is the presence or absence of ascites as a complication. I noted, when I had the opportunity of examining a very large number of solid tumours of the ovary and uterus in the surgical wards of the Samaritan Free Hospital, that peritoneal effusion by no means necessarily means malignancy. It is seen where the tumour has a perfectly smooth surface, and may be absent where there are plenty of outgrowths or inflammatory patches. Is it not, perhaps, due to lymphatic obstruction?

I am, Sir, yours faithfully,

Alban Doran,

Consulting Surgeon, Samaritan Free Hospital.
Palace Mansions, West Kensington, July 2nd, 1923.

ANCIENT SPANISH PHARMACY JARS.

To the Editor of The Lancet.

Sir,—The very fine collection of Hispano-Moresque Pottery, made by my brother, Francis W. Mark, is to be sold at Christie's on July 10th. It contains some rare pharmacy jars of the fifteenth century. I cannot help thinking that some of them would be a very valuable addition to any of the medical museums in England, and hope some generous buyer may, perhaps, help to keep them in this country. Some of them were exhibited at a social evening at the Royal Society of Medicine this time last year, and you were good enough to note the fact in The Lancet. An illustrated catalogue will be sent to you by Messrs. Amor who manage the sale. My brother is grieved that the collection should now be dispersed by auction, as his ambition was that it should be acquired for the nation.—I am, Sir, yours faithfully,

Leonard Mark.

49, Oxford-terrace, Hyde Park, W., June 28th, 1923.

*** This is a remarkable collection of pharmacy jars, and we agree with Dr. Mark that it ought to be kept intact and in some suitable centre for inspection. We hope that a purchaser with the needful public spirit will present himself on July 10th.—Ed. L.

Correspondence.

"Audi alteram partem."

A NEW WORD FOR "DEFATTED" VACCINES.

To the Editor of THE LANCET.

SIR,—In my paper [1] published in the last number of the *British Journal of Experimental Pathology* I gave an account of a method of preparing antigens from *B. tuberculosis* and some other Gram-positive bacteria, and I provisionally described the bacterial antigen so prepared as "defatted," a word that had been used conversationally in my laboratory. I pointed out at the same time that by the term "defatted" it was by no means intended to imply that all fatty or lipoidal substances present in the micro-organisms so treated had been removed. Only some of the lipoidal substances are taken away in this mode of preparation by washing with acetone after formalin treatment. It is plainly desirable, however, that the term "defatted" should not come into general use. It is as false, I am afraid, to the laws of language as it is to the experimental facts. I propose to introduce a new word to describe the vaccines or antigens prepared by this or similar methods of extraction. The essential factors in the process are the fixation treatment by formalin and the successful acetone extraction which the fixation permits. The bacteria so treated become, as I have described, non-acid-fast and Gram-negative, and are changed in appearance. They have been thoroughly washed out, and I propose to call them "diaplytes" from the Greek word *πλυτός*, washed, in its intensive form *διαπλύτος*, washed through and through. I propose to speak of "diaplyte vaccines" or "diaplyte antigens," and in the process of their preparation I should describe the acetone used as being the "diaplytic agent." I think there is justification for introducing a new word for the description of these vaccines, and it seems desirable to use one which has no previous connotations in pathology.

I am, Sir, yours faithfully,
GEORGES DREYER.

Department of Pathology, University of Oxford,
July 3rd, 1923.

THE DIFFERENTIAL DIAGNOSIS OF SMALL-POX AND CHICKEN-POX.

To the Editor of THE LANCET.

SIR,—The main interest of the "Mild Small-pox" discussed by Dr. J. H. Garrett in his article in THE LANCET of June 23rd is its differential diagnosis from chicken-pox; and the special relevance of that lies in the financial and communal results that flow from its correct apprehension and exposition. It comes to this. If a given case be chicken-pox it costs someone, say, one guinea. If it be small-pox, it costs someone else, say, £200. A single case, to which the writer was called, was afterwards calculated to have cost almost exactly that sum. Another single case was calculated to have cost £500. The fact is this. The freedom, which many elect to enjoy, of being able to take an attack of small-pox whenever exposed to it, is a most expensive luxury to all concerned. That is the heart of the matter.

As the present unvaccinated condition of the community throws on all of us who are qualified to practise medicine the onus, whether we like it or not, of being assistants in the matter of endeavouring to keep down this portentous communal expenditure, just so it behoves us all to be equipped with a knowledge of the fundamentals of the differential diagnosis of small-pox and chicken-pox. I have laboured in season and out of season to pass this knowledge on to my colleagues ever since the late Dr. T. F. Ricketts first impressed it on me in 1897, when he went for his summer holidays that year and left me in charge of the diagnosis of London's small-pox. The differential diagnosis, of course, in a close case, turns on the due observance of many points. But the upper extremities usually afford the strongest single item of evidence. They should be exposed to the shoulder; placed in a good light; and then *read.* Not another movement nor a word is usually necessary. The writing is usually all there, to be read by those who know the key. Centrifugal is small-pox; centripetal is chicken-pox. For those who are less expert and desire to use every possible care in arriving at a diagnosis, there may be repeated the advice given in my book "How to Diagnose Small-pox" (edition 1913, page 35).

"Make a practice of plotting out the rash on a diagram of the figure. This most useful practice is strongly recommended. Incidentally it is evidence of care having been exercised, and is useful subsequently if a question is raised about the correctness of the diagnosis.

"The act of dotting in the rash compels close observation of its distribution, and often of itself leads to a correct solution. We shall see presently that a diagnosis of small-pox can sometimes be made, after all the scabs have gone, by noting the situations of the scars or stains which have been left on the skin by the rash. Make a diagram, therefore, no matter how rough, of any case that is not perfectly straightforward. You will be surprised how much it may help you. It may by itself clear up a case that has puzzled you very much."

This advice has been followed by myself in hundreds of the cases which have been referred to me for final adjudication in London and elsewhere during the last 20 years, and its value has been attested over and over again by numerous colleagues and assistants.

I am, Sir, yours faithfully,
W. McCONNEL WANKLYN, B.A. Camb.,
London, June 30th. M.R.C.S. Eng., D.P.H.

IS DIABETES MELLITUS A PROGRESSIVE DISEASE?

To the Editor of THE LANCET.

SIR,—A categorical answer to this question might be possible if the symptom-complex generally known by the name diabetes mellitus were a definite pathological entity, invariably arising from the same cause and always running a similar course, but this is by no means the case, and it therefore does not permit of a plain "yea" or "nay," any more than a similar question regarding a rise of temperature or the existence of painful sensations would do. Glycosuria with hyperglycæmia may arise in at least a dozen different ways, and with each the effects of treatment, and even the progress of the lesion in the untreated condition, varies so widely that it is impossible to lay down any general principle as to the progress of the resulting metabolic defects. As Dr. Langdon Brown has pointed out, all observers interested in the subject "must be familiar with cases which have become apparently stationary as a result of treatment by alimentary rest"; on the other hand, cases in which alimentary rest, however carefully carried out, has not sufficed to stay the progress of the condition must be equally familiar; and the same is true of insulin, for although a certain degree of immediate improvement can usually be obtained, permanent recovery of tolerance after a course of injections is by no means invariable. The reason undoubtedly is that we are not dealing with a pathological entity which always responds in the same way to similar treatment, but with a protean condition which no one form of treatment is able to control.

At the present time it is fashionable to assume that diabetes mellitus is invariably due to disease of the pancreas, disturbances of carbohydrate metabolism arising from other causes being referred to simply as glycosurias. In the absence of some reliable means for distinguishing pancreatic from non-pancreatic cases during life such a classification is merely juggling with words, but fortunately the means are now available, and by appropriate analyses of the blood, urine, and fæces it is possible to determine whether there is deficiency of the internal or external secretion of the pancreas in any case of diabetes, and also to recognise, or exclude, most of the other causes known to give rise to hyperglycæmia. Even if we limit the term diabetes mellitus to those instances in which disease of the pancreas can be shown to exist in this way however, we are still far from being able to answer the question in point with precision, although we are nearer doing so, for it would seem that the progress of the disease can be stayed, and permanent improvement be brought about, either by alimentary rest or insulin, when the hyperglycæmia is dependent entirely, or largely, upon a functional deficiency of the internal secretion of the pancreas, also that its progress, under suitable dietary restrictions, is slow when the condition arises as a result of sclerosis of the gland so that the state of the patient is analogous to that of a partly de-pancreatised dog, but that when the deficiency is brought about by an attempt to control, and compensate for, some other cause interfering with carbohydrate metabolism no treatment directed toward the pancreatic factor alone is of more than temporary benefit.

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[1] Some New Principles in Bacterial Immunity, their Experimental Foundation, and their Application to the Treatment of Refractory Infections, Brit. J. Exper. Pathol., 1923, iv., 146.

The only answer, therefore, which can at present be given to the question under discussion in my opinion, is that, since diabetes mellitus is not a disease but a symptom-complex arising from a variety of causes, each case is more or less a law unto itself, and whether it will progress or not depends upon the accuracy with which it is diagnosed and how far suitable methods of treatment are applied to the particular conditions discovered.

I am, Sir, yours faithfully,
P. J. CAMMIDGE.
Nottingham-place, Marylebone, W., June 26th, 1923.

ETHYL CHLORIDE AS AN ANÆSTHETIC FOR MINOR OPERATIONS IN CHILDREN.

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SIR,—All anæsthetists will read with interest Mr. S. F. Rose's article on this subject in THE LANCET of June 23rd. They will doubtless agree with all he says as to the anæsthetic virtues of ethyl chloride, but those who know how to administer it by the "open method" will certainly disagree with his dictum that "breathing with admixture of air is obsolete and unsatisfactory." Indeed, to many it will seem less enlightened to deprive a patient, particularly a child patient, of free oxygen and to enforce breathing to-and-fro into a closed bag, than to administer an anæsthetic with a free and unlimited supply of fresh air. Surely, this method must be safer than that *in which all* air is excluded, and the mind of the modern hygienist must revolt at the idea of a patient inhaling "the residue left from a previous administration." Mr. Rose acknowledges that children are not good subjects for nitrous oxide. Is not this because they bear deprivation of oxygen badly, and because, in them, this gas without oxygen quickly produces asphyxiation? Why, then, does Mr. Rose think that children will take ethyl chloride better without air than with it? Would he argue that fresh air is bad for children?

Mr. Rose confesses that the closed method has "one drawback"—viz., that "it may cause struggling and holding of the breath," and he mentions the "natural alarm" of the patient excited by its odour. He states that *both* the anæsthetist's hands are required to hold the face-piece in position—no wonder the little patient is alarmed! Contrast this with the open method, in which only a wire mask covered with domette is lightly applied, with one hand, at an angle with the bridge of the patient's nose, at first somewhat away from his mouth; and contrast the sudden presentation of the pungent vapour in a closed bag, with the gradual dropping of the ethyl chloride upon the mask, so that its vapour when inhaled is neither too pungent nor unpleasant. Mr. Rose also confesses to having experienced difficulties owing to—"holding the breath, laryngeal spasm, syncopal attacks, obstructed breathing, and vomiting." All these difficulties I submit are directly due to the closed method of administration, which enforces concentration of the vapour and causes holding of the breath and laryngeal spasm: while syncopal attacks and vomiting are in direct proportion to the duration of the rebreathing. The risks of overdose are great, and syncopal attacks and cessation of breathing are signs of overdose. Mr. Rose advocates abolition of the ocular reflexes, but in my view this is courting disaster, for when the corneal reflex is abolished the coughing reflex is also abolished; thus the sentinel of the larynx is put out of action and the risk is incurred of the patient being drowned in his own blood, or of his lungs being invaded by other foreign matter. I know some throat specialists who will not begin an operation for removal of tonsils and adenoids unless the patient's coughing reflex be brisk.

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I am, Sir, yours faithfully,
HARVEY HILLIARD,
Senior Anæsthetist and Lecturer on Anæsthetics at the Royal Dental Hospital.
June 26th, 1923.

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I am, Sir, yours faithfully,
ALBAN DORAN,
Consulting Surgeon, Samaritan Free Hospital.
Palace Mansions, West Kensington, July 2nd, 1923.

ANCIENT SPANISH PHARMACY JARS.

To the Editor of THE LANCET.

SIR,—The very fine collection of Hispano-Moresque Pottery, made by my brother, Francis W. Mark, is to be sold at Christie's on July 10th. It contains some rare pharmacy jars of the fifteenth century. I cannot help thinking that some of them would be a very valuable addition to any of the medical museums in England, and hope some generous buyer may, perhaps, help to keep them in this country. Some of them were exhibited at a social evening at the Royal Society of Medicine this time last year, and you were good enough to note the fact in THE LANCET. An illustrated catalogue will be sent to you by Messrs. Amor who manage the sale. My brother is grieved that the collection should now be dispersed by auction, as his ambition was that it should be acquired for the nation.—I am, Sir, yours faithfully,

LEONARD MARK.
49, Oxford-terrace, Hyde Park, W., June 28th, 1923.

⁂ This is a remarkable collection of pharmacy jars, and we agree with Dr. Mark that it ought to be kept intact and in some suitable centre for inspection. We hope that a purchaser with the needful public spirit will present himself on July 10th.—ED. L.

THE PROPHYLACTIC TREATMENT OF PUERPERAL SEPSIS.

To the Editor of THE LANCET.

SIR,—That chloroform is the commonest cause of post-partum hæmorrhage I have long recognised, and in consequence whenever I have had to use it preliminary to using the forceps, I have prepared for such result by administering a drachm of ext. ergot liq. In my opinion the commonest cause of puerperal sepsis is gonorrhœa of a chronic variety, the secondary organisms, being the fons et origo mali, preventing the healing up of tears of vagina or perineum even when carefully sutured, even when puerperal fever be not produced, and the use of an organic preparation of silver has prevented the onset of ophthalmia neonatorum. I well remember being called to a primagravida who was suffering from false pains, and discovered chronic gonorrhœa to be present. I had ten days in which to get her disinfected, but by means of plugs saturated with acid. carbol. and glycerine 1 in 20 I achieved success, and although forceps were used and the perineum torn and sutured, her temperature never rose above 98° F., and the tear healed perfectly.—I am, Sir, yours faithfully,

Blackpool, July 1st. FR. S. PITT-TAYLOR, M.B., Ch.B.

EXPERIENCES WITH ETHANESAL.

To the Editor of THE LANCET.

SIR,—I have used ethanesal for nearly 2000 cases in eight hospitals, as well as in private practice, and I should now like to state that whatever its chemical composition, ethanesal has proved in my hands to be an anæsthetic capable of producing unconsciousness with relaxation, without pulmonary sequelæ, and in most cases with an absence of post-anæsthetic vomiting. My list includes abdominal, orthopædic, throat, cerebral and cerebellar operations, and I believe the conclusion of operators and nurses coincides with mine—namely, that ethanesal gives better results than ordinary anæsthetic ether. From my notes I find that slight sickness occurs in about 15 per cent. of the cases, severe sickness in not more than about 1 per cent. At two hospitals—the West End Hospital for Nervous Diseases and the Hospital for Epilepsy and Paralysis, Maida Vale—sickness was always absent, though many of the operations lasted two or three hours.

I am, Sir, yours faithfully,

CHARLES T. W. HIRSCH.

Hyde Park Gate, S.W., June 24th, 1923.

Obituary.

SIR JAMES REID, BT., G.C.V.O., K.C.B., M.D., C.M. ABERD., LL.D. ABERD. AND GLASG., M.D. R.U.I. (HON. CAUSÂ), F.R.C.P. LOND.,

PHYSICIAN-IN-ORDINARY TO THE LATE QUEEN VICTORIA, TO THE LATE KING EDWARD, AND TO KING GEORGE.

Sir James Reid, who died on June 28th at the age of 73, was a trusted royal physician through three generations and a distinguished member of the medical profession.

Born on Oct. 23rd, 1849, he was the eldest son of the late Dr. James Reid of Ellon, Aberdeen, and was a descendant of old Scottish stock on both his father's and mother's side. His early education was received at the Aberdeen Grammar School, where he distinguished himself by being dux and gold medallist in 1865. From here he went to the University of Aberdeen, and graduated M.A. in 1869 with honours and the gold medal, and in 1872 M.B., C.M., with highest honours, while three years later he proceeded to the M.D. degree. Shortly after graduating in medicine and surgery he came to London, where he entered on practice in Upper Westbourne-terrace for two years, and spent another two years in Vienna. Returning to this country he joined his father in practice at Ellon, where he remained till he was appointed resident medical attendant to Queen Victoria on the death of Dr. William Marshall in 1881. At Windsor Castle he acted in conjunction with Sir William Jenner, and in consequence of the failing health of that physician-in-ordinary to Her Majesty, Dr. Reid was formally appointed in 1889 to the position and received in the same year the C.B. In 1895, three years after being elected a Fellow of the Royal College of Physicians of London, he was promoted to K.C.B., and on the occasion of the Queen's Diamond Jubilee was made a baronet. On the accession of King Edward, Sir James Reid was appointed physician-in-ordinary to His Majesty and subsequently to the present sovereign. Sir James Reid's services to Queen Victoria were unremitting, paying two official visits daily wherever the court might be located, while in later years those visits were even more constant. He was a frequent visitor to foreign countries with King Edward, who as a mark of special favour granted him an honourable augmentation to his arms—namely, one of the lions of the Royal Arms of England, the Royal Stags, supporting the coat, wearing round their necks a chain carrying an escutcheon charged with the Royal Crown.

Sir James Reid, who was promoted G.C.V.O. in 1901, was an honorary LL.D. of Aberdeen and Glasgow, M.D. hon. causâ of the Royal University of Ireland, and an hon. F.R.C.P. Ireland, and his various appointments included those of consulting physician to the Convalescent Home for Officers at Osborne, to King Edward VII. Sanatorium at Midhurst, to the Prince of Wales's General Hospital at Tottenham, and to the Royal Ear Hospital. He was a retired Surgeon Lieut.-Colonel in the 2nd Battalion of the Gordon Highlanders and a justice of the peace for Aberdeenshire.

He married in 1899 the Hon. Susan Baring, daughter of Lord Revelstoke and then maid of honour to Queen Victoria, and leaves two sons and two daughters.

JOHN GIRVIN, M.R.C.S. ENG.,

COLONEL, A.M.S. (RETIRED).

LAST week there died in the person of John Girvin a loyal public servant, an educated practitioner, and an able administrator. Born in 1861 he entered St. Bartholomew's Hospital as a student in 1882, after an "apprenticeship" at Dorking—an unusual occurrence even in the "eighties," and qualified M.R.C.S., L.R.C.P. in 1886, receiving his first commission in the Army Medical Service in July of that year. From Colchester he proceeded to India, where he remained for six years, afterwards serving in Ireland, Egypt, and Cyprus. Later he was appointed to the medical charge of the Guards in Wellington Barracks, and for over two years was secretary to Sir Arthur Sloggett. He was subsequently sent to Sierra Leone and then to India a second time as senior medical officer at Hyderabad, Scinde. He returned home in 1913, and during the war helped to form a new hospital for Gallipoli, being appointed, firstly, as chief-in-charge of the advanced base hospital, and secondly, as Deputy Director of Medical Services, a position he held until the evacuation of the troops. After Gallipoli he again served in Egypt, where he was in charge of the 27th General Hospital. On returning to England after the war he fell into ill-health, caused in part by the stress of military service and in part also by the loss of his only son, and he retired with the rank of full colonel at the end of 1918. By temperament Colonel Girvin was silent and reserved, and when selected to serve in a sphere of action where ceremony and ritual are essential observances, his love of order, method, and precision caused him to respect formality and to appreciate the marks of dignity and responsibility. No one, testifies one of his colleagues, could be more faithful to his corps nor more meticulous in regard to the honour of the medical service than was John Girvin.

EDWARD LIDDON, M.D. Edin., M.R.C.S., L.S.A.

Dr. Edward Liddon, who died at Taunton on June 26th at the age of 92 years, was one of the best known practitioners in West Somerset during the second half of the nineteenth century. The son of Captain Matthew Liddon, R.N., he received his medical education at King's College, London, becoming M.R.C.S. in 1852 and L.S.A. in the following year. Proceeding to Edinburgh he graduated M.D. in 1854, taking the gold medal for his thesis. He also studied in Paris and later became a Medical Associate of King's College. After holding appointments at Bath Hospital and at the Consumption Hospital, Brompton, he joined an uncle in practice at Taunton in 1855, and carried on a large general and consulting practice until he retired in 1902. At the Taunton and Somerset Hospital, in which he always maintained a generous interest, he held the post of hon. physician for many years, becoming later a consulting physician and finally president. His lifelong aim was the improvement of the status and education of nurses; he was largely responsible for the foundation of the Nursing Institute attached to the Taunton Hospital, and was a pioneer in the work of providing village nurses to attend the poor. Dr. Liddon had many interests outside his profession: he was a J.P. for Somerset and a leading Churchman and educationist, being prominent in the establishment of the Huish School, now one of the most successful secondary schools in Somerset. An enthusiastic volunteer, Dr. Liddon retired with the rank of Surgeon Lieut.-Colonel of the 2nd Vol. Batt. of the Somersets. Hunting was his recreation; he was well known with the local packs of staghounds and foxhounds and was master for many years of the Taunton Vale Harriers. A man of strong personality, he held decided opinions, but was not carried away by prejudice. He was very widely respected by medical colleagues and public alike, and his benefactions among his poorer patients were many but not generally known. Dr. Liddon was twice married and leaves a widow and two sons.

Medical News.

University of Oxford.—At recent examinations the following candidates were successful:—

Examination for Degree of M.Ch.

Charles H. Carlton, St. John's.

Final Examination for Degree of B.M.

Materia Medica and Pharmacology.—George R. P. Aldred-Brown, Keble; Eric N. Allott, Balliol; Leslie J. Barford, Queen's; Louis W. H. Bertie, St. John's; Robert B. Bourdillon, University; Vernon H. Brink, Hertford; Clarence S. Broadbent and Thomas A. J. M. Dodd, Queen's; Leslie O. F. Fysh, St. John's; Samuel Harris, Jesus; Thomas B. Hodgson, Queen's; Alfred Kendrew, Christ Church; Raymond Lewthwaite, Magdalen; Philip Morton, Keble; Eric L. Newell, Jesus; William D. B. Read, Magdalen; Thomas E. Ryves, Trinity; Bernard G. Scholefield, Christ Church; Richard W. A. Simmons, Oriel; Robert A. Walsh, Magdalen; Arthur Q. Wells, St. John's; Evelyn C. Whitehall-Cooke, Queen's; David O. Williams, Jesus; and Rosa S. Wordsworth, Lady Margaret.

Pathology.—Murray McCheyne Baird, New; Richard E. D. Cargill, Christ Church; Cyril W. Carter and Thomas A. J. M. Dodd, Queen's; Cyril L. Elgood, Balliol; Kenneth J. Franklin, Hertford; Douglas R. Gawler, University; Cyril A. H. Green, Trinity; Harold E. Harding, Oriel; John R. B. Hern, New; John A. Macfadyen, Brasenose; Victor P. Robinson, St. John's; James P. Shaw, Balliol; Insall M. Sidley, Christ Church; Harold N. Stokoe, Pembroke; John G. S. Thomas, Hertford; Bertram E. Tompson, Brasenose; George P. Wright, Exeter; and Mathilde E. F. Bugnion and Janet M. Vaughan, Somerville.

Forensic Medicine and Public Health.—Owen D. Ballinger, University; David T. Barnes, St. John's; Edward F. Chapman, Magdalen; Alexander M. Cooke, Jesus; Richard S. Creed, Magdalen; Robert van Buren Emmons, New; John A. Macfadyen, Brasenose; George F. L. Mitcheson, Christ Church; Eric B. Strauss, New; Tom S. Townsend, Jesus; Horace F. Turney, Magdalen; and Cicely D. Williams, Somerville.

Medicine, Surgery, Midwifery.—John W. Alden, non-collegiate; Philip W. Boobbyer, Keble; Thomas A. Brown, Exeter; Alexander D. Dyson, Corpus Christi; Robert van Buren Emmons, New; Reginald V. Facey, Brasenose; Humphrey C. Hill, Hertford; James P. Shaw, Balliol; Arthur L. B. Stevens, Christ Church; Eric H. Watkins, Hertford; Arthur Q. Wells, St. John's; Claude R. Young, University; William A. Young, Jesus; Sibyl R. Eastwood, Society of Oxford Home-Students; and Cicely D. Williams, Somerville.

University of Sheffield.—At examinations held recently the following candidates were successful:—

M.D. Examination: Robert Platt.

Final M.B., Ch.B. Examination.

Oswald H. Billington, Reginald L. Brown, Alice C. Caiger, Ida Coates, Henry Cretney, Andrew S. Drummond, Clifford S. Dunbar, Denton Guest (with 2nd class honours), William H. Harding, Mona E. Hatherley, Albert B. Nutt, Muriel R. Powell, James E. Schofield, and Annie D. Sykes.

Third M.B., Ch.B. Examination.

William F. L. Castle, George S. Davidson, Edward M. Dearn, Alys M. Gregory, Sidney G. Meanley, and Oscar H. Silverman.

Society of Apothecaries of London.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—L. P. Garrod, St. Bart.'s Hosp.; B. Hart, Sheffield; L. K. Ities (Sect. II.), London Hosp.; and M. S. Mahmud (Sect. II.) and B. Teverson, St. Mary's Hospital.

Medicine.—L. P. Garrod, St. Bart.'s Hosp.; E. W. Hicks, St. Thomas's Hosp.; and B. Teverson, St. Mary's Hosp.

Forensic Medicine.—L. P. Garrod, St. Bart.'s Hosp.; E. W. Hicks, St. Thomas's Hosp.; J. A. H. Sykes, Edinburgh; B. Teverson, St. Mary's Hosp.; and H. Whitby, London Hosp.

Midwifery.—D. Dimitrijevitch, Oxford and St. Mary's Hosp.; L. P. Garrod, St. Bart.'s Hosp.; L. Statnigrosh, Middlesex Hosp.; and B. Teverson, St. Mary's Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: L. P. Garrod, B. Hart, E. W. Hicks, and B. Teverson.

Royal Institute of Public Health.—The Congress in 1924 will be held in Bordeaux from June 4th to 9th inclusive. The President will be Lord Burnham, and the local hon. secretaries Dr. Rene Cruchet, Professor of Medicine in the University of Bordeaux, and Mr. G. Faure, treasurer of the Chamber of Commerce, Bordeaux. The meetings will take place in the University. Special arrangements are being made for travelling and hotel accommodation.

Epsom College.—The seventieth annual general meeting of the Governors of Epsom College was held on June 29th at 49, Bedford-square, London, W.C., Sir Henry Morris, treasurer, presiding. The scrutineers reported that the successful candidates for pensionerships and foundation scholarships were: Ordinary Pensionership, Adelaide Lynch; Foundation Scholarships: Thomas M. Newton, Jeffrey O. Timms, James D. Johnston, Irwin J. McGhie, Denis A. Sanford, H. Vincent Adcock. In submitting the annual report of the Council Sir Henry Morris drew attention to the loss which the College had sustained by the death of Mr. Clement Locke Smiles, and by the retirement from the Council of Mr. Walter Archibald Propert, the grandson of the founder of the College, and announced that Mr. W. Douglas Crossley, who entered the College as a Master in September, 1888, and was appointed bursar in September, 1890, was about to retire, after having served the College for practically 35 years. He further reported that Mr. Bluett, one of the honorary auditors, had died since the last annual general meeting, and that the Council proposed that Colonel Norman C. King, the Registrar of the General Medical Council, should be appointed an honorary auditor in his place. Continuing, Sir Henry Morris referred to two pension funds recently instituted, and mentioned that the Council had decided to propose that, in consequence of the increased cost of living, amendments in the by-laws should be made with the view of permitting a somewhat larger income than that hitherto held by persons wishing to become candidates for various pensionerships—namely, £100 a year instead of £60. He stated that steps had been taken to begin at once the work of rebuilding the nave of the chapel in harmony with the new chancel, in spite of the fact that the funds in hand were not sufficient for the purpose, and he urged all friends of the College to do their best to secure contributions for this purpose. In thanking those persons and organisations that had assisted the Royal Medical Foundation attached to the College by obtaining donations and subscriptions during the year, he stated that it had long been customary to elect as vice-presidents those who had collected the sum of £1000, and as the Rev. Walter J. Barton, the late headmaster, had completed this sum, the Council proposed that he should be elected a vice-president of the College. At the termination of the proceedings a cordial vote of thanks to the chairman was proposed by Dr. Raymond Crawfurd, seconded by Mr. Hollis Walker, K.C., and carried with acclamation.

SOCIETY FOR THE STUDY OF INEBRIETY.—The next meeting of the society will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on July 10th, at 4 P.M. Prof. A. Louise McIlroy will open a discussion on the Influence of Alcohol and Alcoholism upon Antenatal and Infant Life.

CALEDONIAN MEDICAL SOCIETY.—The thirty-eighth annual meeting of this society was held on June 29th in the rooms of the Aberdeen Medico-Chirurgical Society. Dr. David Rorie took as the subject of his presidential address the Career of Dr. George Boswell, who was surgeon to King James VI. of Scotland. The meeting was largely attended, and at the dinner the same evening 70 members and friends were present. It was arranged to hold the next meeting of the society in Liverpool under the presidency of Dr. David Smart.

COMPLIMENTARY DINNER TO DR. WILLIAM MAYO.—The Surgical Section of the Royal Society of Medicine gave a complimentary dinner to Dr. William Mayo, of Rochester (Minnesota), at the Hotel Cecil on June 27th. Mr. James Berry, the President of the section, was in the chair, and there was a large attendance of Fellows and Members of the section from all parts of the United Kingdom. After the loyal toasts, the chairman proposed "Dr. William Mayo," giving a vivid account from first-hand information of the Mayo Institute at Rochester, and some pleasing glimpses into the lives of the Brothers Mayo. Dr. Mayo, in responding, spoke of the zeal for education in a State of 3 million inhabitants which had 11,000 students attending its University and 8000 more intimately connected with it. The accumulated income of the Mayo Clinic, amounting to 7 millions, not including real estate of 3½ millions, had now been handed over as permanent endowment to trustees who understood what surgical treatment meant, and he hoped that the Clinic was thus safe for a generation. Sir Berkeley Moynihan proposed "American Surgery," reciting the names and achievement of a series of American surgeons, most of whom bore Irish names, amongst them Dr. William Mayo, who, he said, was "the greatest statesman in surgery of all time." Among the characteristics of American surgery he included masterly technique, fertility in suggestion, integrity of utterance, and an unbounding hospitality to new ideas. Dr. Donald Balfour, who responded, sketched the problem of surgery in American rural practice and the possibility of raising the general standard of surgery in the U.S.A.

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—At a meeting of the General Council, held on June 26th, at 1, Wimpole-street, W., with Sir George Makins in the chair, the Council nominated the honorary officers of the Association for election at the annual meeting. The President, Sir George Makins, having intimated his desire to retire from office, it was unanimously agreed on the proposal of Mr. Carson, seconded by Dr. Myers, that Sir Arbuthnot Lane be nominated to serve in his place. It was proposed from the chair and unanimously agreed that, if willing, Sir Humphry Rolleston be nominated for re-election as chairman of the Executive Committee. On the proposal of Dr. C. B. Heald, seconded by Dr. C. O. Hawthorne, it was agreed to make no further nominations for the office of honorary treasurer, and Sir John MacAlister was unanimously nominated for re-election and also Mr. H. J. Paterson and Dr. H. MacCormac as hon. secretaries. The reports of the hon. treasurers and secretaries were received and approved for submission to the annual meeting. It was agreed that the date of the annual meeting be fixed for Friday, July 13th, at 5.30 P.M.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—The programme of the next quarterly meeting, to be held in London next week, is as follows: On July 10th, at 11.30 A.M., at 11, Chandos-street, a paper will be read by Dr. R. M. Stewart, entitled General Paralysis: Its Unsolved Problems. At 3 P.M., at the Royal Society of Medicine, 1, Wimpole-street, W., Lieut.-Colonel E. Goodall will give his presidential address on Considerations, Bacteriological, Toxicological and Hæmatological, and others therewith associated bearing upon the Psychoses, and at 4.30 P.M. Dr. J. G. Porter Phillips will give an address on the Early Treatment of Mental Disorder: A Critical Survey of the Out-patients' Department. On July 11th, at 10 A.M., at 11, Chandos-street, a discussion on the Relation of Chronic Sepsis to the So-called Functional Mental Disorders will be opened by Dr. Henry A. Cotton, followed by Sir W. H. Willcox, Dr. William Hunter, Dr. D. Chalmers Watson, and Dr. T. C. Graves. Dr. Clement Lovell will read a paper on the Surface Tension of the Serum in Anxiety Psychoses. In the evening the annual dinner of the Association will be held at the New Metropole Hotel, Northumberland-avenue, W.C. On July 12th, at 10 A.M., at 11, Chandos-street, a paper on the Histological Examination of 110 Cases of the Pituitary Body of Patients Dying in Asylums and Hospitals will be read by Sir Frederick Mott, F.R.S., and Dr. I. M. D. Robertson, and one on the Psychogenic Factor in the Causation of Mental Disorder by Dr. Thos. Beaton. At 3 P.M. a visit will be paid to the Maudsley Hospital, Denmark Hill, under the guidance of Dr. Edward Mapother. On July 13th, at 10 A.M., at 11, Chandos-street, the following papers will be read: Basal Metabolism in Mental Disorders, especially Dementia Præcox, and the Influence of the Diathermic Current on the Same, by Dr. James Walker; the Diagnosis of Dysenteric Infections in Mental Hospitals, by Dr. A. A. W. Petrie; and the Ranchi European Mental Hospital, India, communicated by Major Owen Berkeley-Hill.

TUBERCULOSIS CONFERENCE AT BIRMINGHAM.—The ninth annual conference of the National Association for the Prevention of Tuberculosis is to be held in the University, Edmund-street, Birmingham, from Thursday, July 12th, to Saturday, July 14th. The Lord Mayor of Birmingham will formally open the conference at 10.30 A.M. on Thursday, when a discussion will follow on the Care of Advanced Cases of Tuberculosis. The other main subjects for discussion will be the Extent and Nature of Damage Done by Tuberculosis Derived from Infected Milk; the Work of Tuberculosis Care Committees; the Relative Prevalence of Tuberculosis Among Workers in Different Trades; and the Notification of Tuberculosis with the Proposed Amendments of Procedure. The public address on Friday evening, at 7.30, will be delivered by Sir Robert Philip on the Actual Position of the Tuberculosis Problem To-Day. Saturday will be left free for tours and visits to institutions.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, JULY 3RD.

The Value of Garden Suburbs.

THE Earl of ONSLOW moved the second reading of the Housing, &c. (No. 2) Bill, which has passed through the House of Commons.

Lord DAWSON of PENN said that for the cure of disease they were increasingly moving in the direction of open-air treatment. In the near future hospitals would be to a large extent constructed in the open with open wards. If they were going to use fresh air for the cure of disease, how much more profitable if they used it for its prevention. Any remedy, however, which was too ambitious would be crushed under its own weight, and any reform which did not carry educated opinion with it would defeat its own end. Therefore it appeared that this Bill went as far as in the present state of knowledge and public opinion it was wise to proceed. He urged the Government to give more generous consideration to that part of the Bill which was concerned with the housing of communities—to those provisions which enabled town planning and garden suburbs to be tried and expanded. Nothing could be more productive of permanent good than the extension of town planning and of garden suburbs. The Government ought to give as generous a trial as possible to the garden suburb schemes set forth in the second part of the Bill.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 27TH.

SCOTTISH HEALTH ADMINISTRATION.

THE House went into Committee of Supply on a Vote of £1,773,730 for the salaries and expenses of the Scottish Board of Health, Captain FITZROY in the chair.

Captain ELLIOT (Parliamentary Under Secretary for Health for Scotland) said that his department had provided three main lines of statistics which it seemed to him would be of great value in estimating the effect of the recent trade depression on the health of the population. In Scotland in the years 1910–14 the average death-rate from tuberculosis was 172 per 100,000; in 1918 the rate was 118; in 1922, 119. They were therefore very considerably better than they were in the years before the war. In the years 1910–14 the five years' average for England and Wales was 140; in 1921, 113; in 1922, 112. As to phthisis, in Scotland the average death-rate for 1910–14 was 111, while in England and Wales it was 102. In 1921 the Scottish rate for phthisis was 81, while it was 88 in England and Wales. In 1922 the Scottish rate was 83, while in England and Wales it had gone up to 89. These were index figures, but they were most valuable at arriving at the true state of affairs. He would give the Committee the 1918 death-rates for some other countries. In that year the death-rate from tuberculosis (all forms) was in Scotland 160, and in England and

Wales 169. In Budapest it was 611; Warsaw, 591; Lodz, 775; Jugo-Slavia, 400 to 500; and Czecho-Slovakia, that was Prague, 386. The death-rate from influenza in all forms in our country for the three waves that swept over the country was 477 per 100,000, so that in the foreign countries he had quoted the death-rate was in relation to tuberculosis greater than the death-rate in this country from influenza.

The average infantile mortality-rate per 1000 births for 1871–80 was in Scotland 123 and in England and Wales 149. That was before the grants in regard to child welfare were made. The figures for 1911–15 were 113 in Scotland and 149 in England and Wales. In 1920–21–22 the figures for Scotland were respectively 92, 90, and 101, while for England and Wales they were 80, 83, and 77. In the first quarter of last year the rate was 141. That was when maternity and child welfare grants were given, while for the corresponding quarter of this year the figure was 98. As to insurance and sickness benefit the expenditure per week per insured person was 2*d.* in 1913 and 2¼*d.* in 1914, and the expenditure on males on sickness benefit was less than 2¼*d.* in 1920 and less than 2¾*d.* in 1921. The increase must be balanced by the fact that a big increase in the percentage of benefit had been decreed by statute. These three lines of argument went far to substantiate the contention he had advanced as to the surprising extent to which the present system was preserving the health of the people under the great industrial depression.

Referring to the tuberculosis grant, the hon. gentleman said that, roughly speaking, the Board had been able to implement their promise to pay 50 per cent. of the grant to the local authorities. A reduction was contemplated in three cases because the figure of the local authorities in those areas was a very high one, and higher than that of other local authorities who were approximately in the same position. The estimated cost of the middle ward in Glasgow was 71*s.* per week, and there was a wide discrepancy there. The figure for Glasgow for the maintenance of tuberculous patients treated in fever hospitals was 57*s.* per week, and the corresponding Mid Lanark rate was 46*s.*, as compared with the Edinburgh figure of 37*s.*, the Dundee figure of 36*s.*, and Aberdeen 38*s.* It would therefore be seen that there was, in the Board's opinion, need for further scrutiny of these figures. The reductions suggested would still enable the Glasgow authority to pay some 40*s.* per week, which was higher than Edinburgh, Dundee, or Aberdeen. Glasgow, with 29 per cent. of beds, proposed to spend 39 per cent. of the expenditure, and in the middle ward, with 10 per cent. of beds, it was proposed to spend 15 per cent. of the expenditure. The Scottish local authorities had had one or two meetings on questions of public health, and in particular there had been a very interesting conference in connexion with venereal diseases. There was a widespread feeling that further powers of compulsion should be given to these authorities by statute, particularly in relation to children. He hoped that the report of the committee appointed to inquire into the high death-rate among mothers would shortly be presented.

Mr. Sullivan moved to reduce the Vote by £100.

Dr. Chapple said there was one very satisfactory feature of the report of the Scottish Board of Health, which was that notwithstanding the enormous unemployment and the tremendous fall in wages the death-rate was going down, the disease-rate had been going down, and mortality from tuberculosis had been going down. The unsatisfactory aspect of the report was that part in which they were told that the lack of improvement in regard to tuberculosis was largely due to the fact that they had not enough sanatoriums and not enough money. It was a tragedy that there should be people in Scotland suffering from any dire but preventable and curable disease who could not get the advantage which modern medical science and modern preventive treatment made possible for them.

In the debate which followed, Mr. Maxton, a Glasgow Labour Member, said that at a time when an epidemic was raging in Scotland, disease was at its worst, and the death-rate at its highest, hon. gentlemen on the Ministerial side of the House, in the interest of saving money, which the right hon. Baronet the Member for the City of London approved of, issued a circular condemning children to remain in the breeding ground of infection. He called it murder, and the men who initiated the policy were murderers. They had the blood of infants on their hands.

The hon. Member was called upon to withdraw, but he refused to do so, and eventually the Speaker was called in, and Mr. Maxton was suspended from the service of the House by 258 votes to 70.

The withdrawal of the hon. Member led to further trouble on the Labour benches, and before order was finally restored three other Glasgow Labour Members, Mr. Wheatley, Mr. Stephen, and Mr. Buchanan, were also suspended.

Mr. Macpherson, continuing the debate, referred to the work of the Highlands and Islands Medical Service, which he said read like a romance. One fact that had always impressed itself upon him was the heroism, gallantry, the kindness and self-sacrifice of the Highland doctor. He should be glad if it was possible where the district was remote and difficult to increase what was called the mileage of these doctors. The same praise could be meted out to the nursing staff. The State should see to it that every doctor in the Highlands had a house provided out of the funds of the Board. Referring to the outbreak of botulism, which occurred in his constituency last year, Mr. Macpherson said that nothing could have exceeded the care with which the Board undertook their investigations and the promptitude with which they were on the spot.

The motion to reduce the Vote was negatived on a division by 209 votes to 118, and the vote was then agreed to.

Typhus Fever in Skye.

Mr. Maxton asked the Under Secretary to the Scottish Board of Health what were the conditions prevailing in the Island of Raasay, Skye district, which rendered possible a recrudescence of typhus fever; and what action had been, or was proposed to be, taken to remove the predisposing cause of a recurrence of typhus fever in the island.—Captain Elliot replied: While the primary cause of the outbreak of typhus fever in this locality last year is unknown, there is no reason to believe that the epidemic resulted from causes other than those social and personal conditions of life which are usually responsible for this disease. The medical officer who was sent to deal with the outbreak experienced considerable difficulty in taking measures with a view to preventing a recurrence of the disease owing to the active opposition of a proportion of the inhabitants to the treatment considered necessary by him. The matter was referred to the local authority, who did not consider it expedient in the whole circumstances to resort to compulsory measures.

Unemployment and Sickness in Salford.

Mr. Tillett asked the Minister of Labour whether he was aware of the serious condition of the 10,000 unemployed in Salford and the ill-health arising therefrom; and what steps he proposed to take to mitigate the evil and danger of this state of affairs, which had remained practically stationary during the past six months.—Sir M. Barlow replied: I am aware of the regrettable extent and duration of the unemployment in Salford. Assistance has been given to various relief schemes in the locality, both through the Ministry of Transport and through the Unemployment Grants Committee, and, of course, any further schemes put forward would receive careful consideration. In addition, I understand that the Ministry of Transport are now in communication with the Lancashire County Council with a view of inaugurating in the district some substantial road works for the relief of unemployment.

Medical Research Grant.

Mr. Becker asked the Minister of Health how the grant of £135,000 made to the Medical Research Council was disposed of; the chief channels of its disposal; and was £5000 the only sum which was apportioned to cancer research.—Lord E. Percy replied: Roughly, one-third of the annual grant of £130,000 is allocated by the Medical Research Council to the payment of their research staff and the maintenance of their central laboratories at the National Institute for Medical Research. The remainder is distributed in grants in aid of research work carried out by universities, hospitals, and other centres throughout the country. In addition to the sum of £5000 expended in grants for work directly upon cancer, radium owned by the Government to the value of over £70,000 is made available by the Council for approved research into the treatment of cancer. I would, moreover, remind my hon. friend that the problems of cancer may be solved sooner, and perhaps only, through advances in fields of medical science other than the direct study of the disease itself, and that, accordingly, advances in the knowledge of cancer are effectively promoted by the grants for research in the more primary parts of the medical sciences. I may add that the allocation for cancer work varies from year to year, as the Council find useful opportunities for supplementing the work done by the Imperial Cancer Research Fund and other institutions devoted specially to this subject.

Panel Practitioners' Conditions.

Sir Kingsley Wood asked the Minister of Health when the discussion between himself and representatives of the insurance practitioners and approved societies was to take place; and whether he proposed to make a statement to the House on the conclusion of such discussion.—Lord E. Percy replied: The Insurance Acts Committee met representatives of the Ministry yesterday to discuss recommendations of the Panel Conference in regard to the revision of the terms of service. Further discussion will be necessary on certain points with the Insurance Consultative Council. No joint conference, such as my hon. friend suggests, is contemplated at present, and it is unlikely that any definite decision as to the rate of remuneration will be reached before the autumn.

Mr. D. G. **Somerville** asked the Minister of Health the form in which the official proposals for the renewal of the panel system under the National Health Insurance Act would come before the House; and whether any such scheme would be considered in the autumn.—Lord E. **Percy** replied: Any changes in the terms of service of insurance practitioners apart from the amount of the practitioner's remuneration will involve an amendment of the regulations, and any amending regulations will be laid before Parliament in accordance with the provisions of Section 65 of the National Insurance Act, 1911. My right hon. friend is not yet in a position to say when the amending regulations will be made.

Mental Deficiency Administration.

Mr. **Frank Gray** asked the Minister of Health whether he was aware that many complaints had been made in several localities of the exercise of the wide powers conferred by the Mental Deficiency Acts, 1913 to 1919, over individuals; and whether he would cause inquiry to be made into the exercise of these powers and the foundation for the complaints made.—Lord E. **Percy** replied: As far as I am aware, the powers referred to are exercised with care and discretion. If the hon. Member has any specific cases in mind and will give me particulars I will ask the Board of Control to investigate them.

Diagnosis of Small-pox.

Mr. **Becker** asked the Minister of Health the number of cases of small-pox notified during the first three weeks of this month; had he any information to the effect that in parts of the country small-pox had been wrongly diagnosed as chicken-pox; whether the spread of small-pox was increasing or not; and whether his department attributed this to people refusing to be vaccinated.—Lord E. **Percy** replied: The figures for the week ending June 23rd are not yet available, but the number of cases of small-pox notified during the previous three weeks was 183. This figure is subject to revision in the light of information which may subsequently be received. The answer to the second part of the question is in the affirmative. As regards the third and fourth parts, my right hon. friend is advised that there has recently been an increase in the prevalence of this disease, and that the neglect of vaccination has undoubtedly contributed to its spread.

Small-pox in Gloucester.

Mr. **Lansbury** asked the Minister of Health whether, seeing that two medical men practising in Gloucester, who had had before them many more cases than any other medical men in the town, had not notified a single case of small-pox, but had certified a large number of patients as suffering from chicken-pox, and seeing that the medical officer of the town did not agree with the diagnosis and report of the Ministry of Health officials, asserting that small-pox was prevalent in the town, he would order a public inquiry into the whole facts connected with this assumed outbreak of small-pox, the inquiry to be conducted by a committee of laymen with expert advisers.—Lord E. **Percy** replied: My right hon. friend is satisfied that small-pox is prevalent in Gloucester, and sees no reason for a public inquiry into that point.

Tuberculous Treatment in Scotland.

Mr. **Wheatley** asked the Under Secretary to the Scottish Board of Health if it was the intention of the Board of Health to reduce the grant to local authorities in Scotland towards the cost of tuberculous treatment in 1923–24; and if he has received any protest from local authorities on the subject.—Captain **Elliot** replied: The Board have informed local authorities, with three exceptions, that they will pay the usual 50 per cent. grant on the actual expenditure included in their estimates for the year 1923–24, subject to audit of claims. In the case of the three authorities referred to, certain items of their estimates made provision for expenditure at rates much in excess of those for other comparable authorities, and the Board have intimated that they will pay grant only on an amount less than that provided in the local authority's estimate. As regards expenditure not included in the estimates for the year for which approval has been asked by local authorities, and to which the Board on the merits have no objection, the Board have intimated that grant can be paid only in so far as there are savings available. With regard to the last part of the question, the Board have received a copy of a resolution adopted at a conference of representatives of local authorities to the effect that the distribution of grant in aid of the treatment of tuberculosis should be made on the basis of actual approved expenditure, and not on estimated approved expenditure. The distribution of the grant for 1923–24 will, as I have explained, be substantially on the lines recommended in this resolution.

Deaths from Cancer.

Major **Molloy** asked the Minister of Health what proportion of deaths in the four decades, 1881–90, 1891–1900, 1901–10, 1911–20, and in the year 1921 from all causes other than violence or accident were due to cancer in those who lived to be 30 or upwards.—Mr. **Neville Chamberlain** replied: From 1881–1910 deaths were grouped by age in five-year periods up to 25 years, and afterwards in ten-year periods, so that it is not possible to give the required particulars for ages from 30 and upwards. The following table gives the proportion for ages from 35 and upwards for the whole of the period covered by the question, and, in addition, the proportions for 1911 to 1920 and 1921 for ages from 30 and upwards.

Percentage of Total Deaths (excluding Violence) due to Cancer.

Age 35 Years and Over.	
1881–1890	6·6
1891–1900	8·5
1901–1910	10·9
1911–1920	12·4
1921	15·3

Age 30 Years and Over.	
1911–1920	12·3
1921	14·9

Thursday, June 28th.

Ministry of Health Vote.

The House went into Committee of Supply on a Vote of £12,504,210 for the salaries and expenses of the Ministry of Health, Mr. **James Hope** in the chair.

Mr. **Neville Chamberlain** (Minister of Health) said that ever since he had taken part in public affairs, whether local or national, he had felt that improvements in the public health were of more importance to the nation than anything else. Sickness and ill-health meant that a vast army of people had to be maintained at the cost of their fellows while they were unable to work, and the withdrawal from the productive activity of the country of a large number of people who otherwise might contribute to the nation's wealth. Taking only the insured population in the year 1922, upwards of 19,500,000 weeks of work were lost from this cause alone. It was some consolation to reflect that the work that was being done by way of preventive medicine was not in vain. During the first 10 years of this century the death-rate in this country was 15·4 per 1000. In the following 10 years, including the war years, it had fallen to 14·3, not including the deaths of those who were actually killed in the war. Last year it had fallen as low as 12·8. After quoting figures to show the decrease in infantile mortality in recent years, Mr. Chamberlain said that the expectation of life among all classes of the population was steadily increasing, and a baby born to-day could reasonably expect to live 12 years longer than its grandfather. Tuberculosis and cancer were very far from being the most fatal diseases. Easily the first in fatal effects were the respiratory diseases—pneumonia, bronchitis, &c.—the high mortality from which was due to the congested conditions and polluted atmosphere of our large towns. Next to the respiratory diseases were those of the heart, and after them came the diseases of the nervous system. Cancer, which was fourth on the list, accounted for about 96 per 1000 of all deaths from all causes. He was sorry to say that this disease was increasing among our people. In 1900 cancer deaths per million of the population were 829; in 1910 they had risen to 967, and in 1921 to 1215. Two allowances must be made. The first was that methods of diagnosis were constantly improving. Then the fact that people lived longer than formerly brought a larger proportion of the population into that comparatively short span which was called the cancer age. Cancer was most prevalent between the ages of 50 and 60. He had at the Ministry of Health a Standard Medical Committee on Cancer which advised him from time to time. Researches were being undertaken by three bodies—the Cancer Research Fund, the Middlesex Hospital, and the Cancer Hospital in the Fulham-road. In addition the subject was constantly under the attention of the Medical Research Council, and in the last few weeks another body had started, the British Empire Cancer Campaign. If that new body could succeed in coöperating with the existing bodies and in forming some sort of coördinating influence between them all he would heartily welcome its existence and be glad to give it his support.

He was glad to be able to give a much more encouraging account of tuberculosis than of cancer. In 1867 the deaths from tuberculosis per million of the population were 2653; in 1887 they had fallen to 1685. In 1907 they were only 1125, and last year they were only 885 per million. Just lately two new methods of treatment had come under the notice of the Ministry of Health—the first devised by Mr. Spahlinger and the other elaborated by Prof. Dreyer of Oxford. A little while ago venereal disease was occasioning a great deal of anxiety on account of the great increase in the number of cases after the war, and arousing a great deal of controversy in the activities of two different schools of thought as to the proper method of treatment. Fortunately the disease was fairly rapidly on the decline, and they were going back to more normal methods and figures. They might attribute a great deal of this result to the fact that they had established a number of clinics throughout the country of which there were 191 now in existence. He hoped that the number of clinics might be increased. The report of Lord Trevethin's Committee seemed at last to offer some basis upon which these two schools of thought might come together and work harmoniously in the future for the common good. He hoped that it might be possible for him to make some progress on the main lines suggested by that committee.

Small-pox, owing to the amount of vaccination that went on, was for some time almost extinct in this country. In 1917 there were only seven cases, but he was sorry that there had been a very serious revival in the prevalence of this disease. In 1922 there were upwards of 973 cases, and this year up to June 16th there had been already 955 cases. He thought it was his duty to speak plainly on this matter, and he considered that the situation was distinctly serious. Twenty years ago 75 per cent. of the children born were vaccinated, and to-day only 38 per cent. were vaccinated. There was a possibility of their being faced with an outbreak of small-pox which would not only be dangerous to health and even to life but would certainly inflict a very serious damage upon the commerce of the country. He was watching, and would continue to watch, the situation with close attention, and in the meantime he desired to emphasise as strongly as he could that the one sure protection against small-pox was vaccination, and that those who not only refused to be vaccinated themselves but gratuitously advised others to follow their example were taking upon themselves a very grave responsibility, which they might some day be called to account for at the bar of public opinion. Reverting to the question of infantile mortality, the right hon. gentleman said that he thought it might largely be taken to be the result of the infant welfare centres, of which there were now 1950 in the country. They wanted more centres, more pre-natal clinics, more free medical attendance, more health visitors, and improved practice in midwifery.

Up to the present the Voluntary Hospitals Commission had spent £425,000 out of the £500,000 voted by Parliament. Fortunately the deficits for 1921 were substantially less than had been estimated, and the deficits had now practically all been cleared off with the exception of a few cases in which the hospitals were unable to raise the equivalent amount of money to justify a grant being made. In 1922 it was believed that the deficits would prove to have been less than was anticipated. The success of what was called mass contributions had substantially increased hospital incomes. Although the ordinary expenditure might increase still further in the future, with the revival of trade and the reduction of taxation the resources of the hospitals might be expected to increase, and they need not take a gloomy or despairing view of the future. More beds were required to accommodate patients undergoing operations or some specialised treatment, and the result of the natural increase in demand, coupled with the fact that there had been no increase in the supply, had been that every hospital now had a terrible waiting list. Unless the voluntary system was able to provide for the inevitable growth in the number of beds required and to bear the increased burden of maintenance necessitated by that, the system could not be said to be standing on safe ground. While the outlook was still serious, he should consider it a mistake to come to any hasty conclusion upon it, because the voluntary system had shown such remarkable vitality and persistency in extraordinarily trying times. One other way in which some relief could be given to the hospitals was through the Poor-law infirmaries. In conclusion, Mr. Chamberlain pointed out that the estimates of his department had been reduced in two years by nearly £4,750,000. He thought that they had almost got to the end of reduction. It would really be impossible to make further savings without trenching on services which in the public interests ought not to be curtailed.

Sir **KINGSLEY WOOD** said some £8,250,000 per annum had been paid to the 12,000 odd doctors on the panel under the Insurance Acts. Since the Act had been put into force £53,000,000 had been paid to them. He believed, and he had no doubt the Minister believed, that in very many respects the insurance medical service could be very greatly improved. One of the great defects was that only about half the general practitioners of the country had undertaken service under the Act. Large numbers of doctors might have big private practices, but he believed that there were also a very large number who had professional objections to serving under this administration, and they would never get a much more perfect service until they were able to attract a good many more medical men and induce them to take service. He made no general indictment against the profession, but they knew that there was a great body of complaints about the present service. There were far too many patients on doctors' panel lists. There were some 11 per cent. of the panel practitioners who had between 2000 and 3000 patients and 3 per cent. who had over 3000 patients. That called for immediate attention and remedy. When most of these medical men had a private practice as well, how on earth they could give proper attention to either practice he could not understand. His suggestion was that insured persons should be able to change their doctor at any time after reasonable notice. He did not think that the insured patient was getting the same or as good treatment as the private patient, and yet he was certainly entitled to it. The trade union which looked after the interests of the medical men in this country had issued a document counselling the members of their Association as to what they were to do if the Minister of Health did not accede to their demands as far as remuneration was concerned. That document, as he understood it, said that in certain events unless the Minister came to terms with the medical profession they would decline to carry on and engage in the service of the Act. He hoped that his right hon. friend would take no notice of such tactics, because he believed he would have behind him the whole of the country in resisting that kind of method from a body of men from whom they expected better things.

Sir **GEORGE BERRY** emphasised the importance of milk sterilisation, which he said was compulsory in some countries. He agreed that vaccination was essential, and that it was criminal to neglect it. He would like to see the voluntary system continued. It attracted the best class of medical men. He had always been an opponent of the panel system, not so much on account of the system itself as because of the way it was worked.

Dr. **WATTS** said that in regard to the small-pox epidemic in Gloucester and certain difficulties of diagnosis he thought that was one of the strongest arguments in favour of vaccination. In his younger days no medical man would have mistaken chicken-pox for small-pox. Labour Members and others made a great point of improved sanitation in regard to the decrease in small-pox. To a certain extent and degree that was perfectly true, but it was not the whole story. Scarlet fever, measles, and small-pox had been subjected to exactly the same sanitary conditions: but whereas the first two were as prevalent to-day as they were formerly, small-pox up to the last year or two had practically died out in this country. He was not asking for fresh legislation, but merely that the law as it existed should be carried into effect. Dr. Watts referred to the danger that within a very few weeks Mr. Spahlinger's establishment and his apparatus would be sold. He wished that rather than spend hundreds of thousands a year on sanatoria the Minister of Health would devote a few thousand pounds to helping Mr. Spahlinger. As regarded the panel service, while he had been a bitter opponent of the system, and he granted that in the early days the work was bad, to-day he was of opinion that the work was cheerfully, well, and efficiently done. There might be regrettable cases here and there—there must be black sheep everywhere—but on the whole he thought the practitioners were giving good service.

Major **MALLOY** said as a doctor who had never had anything to do with national insurance, as far as his experience went, and it was a pretty large one, the work done by the panel doctors was, as a rule, extremely good, and vastly superior to anything that obtained under the old dispensation. The hon. gentleman quoted a series of statistics to show the grave rise in the number of deaths from cancer, and urged the importance of cancer research. There was a great deal of danger in relying upon the generosity of the charitable and the frightened, because that was a precarious source of income at any time. Most of the men who did the best work in the laboratories throughout the country did not get as good wages as a first-rate chauffeur. The money went in the expense of apparatus and in costly experiments which had to be continued over long periods. He thought the Ministry of Health should not only be the mainspring but the master of any efforts made in this direction.

Mr. **NEVILLE CHAMBERLAIN**, replying to the debate, said that he agreed that the panel system, whatever might have been its defects and faults, had done a very valuable service, and had done much to raise the standard of medical attendance among the poorer classes of the people. He thought it had come to stay. At the same time every effort would be made to improve the service. In view of the fact that the present arrangement for the remuneration of the doctors came to an end in December, 1924, it was necessary before settling new terms to discuss with the doctors the arrangements of the service. A certain amount of discussion had taken place already. One subject was the limitation of the panel. Another, that there should be no private fees paid for services coming within the scope of the contract. Another was greater freedom in the choice of doctors than at present, and one more, of considerable importance, was that they should be able to secure that proper records were kept of each case. It was very important that this should be done, so that there should be in existence some records of the medical history of the patient. And that also would be valuable when the patient was changing his medical practitioner. When they had some agreement on various points, then they would have to go into the question of remuneration, and he could give his hon. friends the assurance that this matter would be discussed in the House sooner or later, very probably in the course of the autumn session, because he thought it was most likely that further legislation would be necessary in order to put into operation the new arrangement to which they might come. As regarded the Spahlinger treatment, he understood that a movement was going on for the raising of a sum of money privately which, if successful—as he had some reason to hope it might be—would enable Mr. Spahlinger to produce his remedies in sufficient quantities to be available for experiment, and he would then send a supply over here, where they would be handed to the Ministry for examination. The process discovered by Dr. Dreyer, as to which they had much more complete information, was very encouraging in its results. It was the policy, however, of the Ministry to test out any remedy submitted to them which seemed at all hopeful. As to the new School of Hygiene, plans had been prepared and a site chosen near the University buildings. The school would be affiliated to the University of London, but it would be governed by a body for which a charter of incorporation was to be sought, and in the meantime the work would be carried on by a transitional executive committee with the concurrence of the Rockefeller Institute. That committee, of which he was ex-officio chairman, had to consider the possible amalgamation or coöperation with similar institutions; it would go on with the preparation of plans and probably begin the building of the institution itself. But, most important of all, it had to proceed with the appointment of a director. They hoped to be able to make an appointment before very long. With regard to the recommendations of the Cobb Committee in connexion with lunacy, there were two lines of progress which were engaging his attention. One was the prosecution of research into all forms of mental disease, which had been taken up with considerable enthusiasm by a number of local authorities; the other line was the treatment of incipient cases without certification. The Mental Treatment Bill attempted to make some progress in that direction.

The Vote was agreed to.

Pensions Disability Committee.

Mr. Pielou asked the Minister of Pensions whether he could inform the House the composition of his Pensions Disability Committee; whether this Committee's findings had ever been published; and, if not, whether he would undertake to publish the result of the work of this Committee, especially that part that concerned the recommendations made to the doctors on the special boards in connexion with the examination of pensions for final awards.—Major Tryon replied: The Disability Committee is composed of the Presidents of the Royal Colleges of Physicians and Surgeons and of other distinguished physicians and surgeons, together with the chief medical officers of my department. The recommendations of the Committee with regard to the medical considerations which should be taken into account in determining the assessment of special classes of disability, in connexion both with conditional and final awards, are issued from time to time to all medical boards and medical officers concerned in the assessment of pensions. It would not be to the public advantage, in my opinion, to make a general publication of these recommendations of the Committee, which are of a purely technical character and deal with such questions as symptoms and diagnosis.

Changes in Pensions Headquarters in the North.

Mr. Albert Alexander asked the Minister of Pensions whether it was proposed to amalgamate the Yorkshire regional headquarters of the Ministry with the northern regional headquarters, and to close the regional headquarters at Leeds; and, if so, what were the reasons for the proposed change. Similar questions were asked by Mr. F. Jowett and Sir J. Butcher.—Major Tryon replied: The amalgamation of the northern and Yorkshire regions has been decided upon as a measure of administrative reform. I wish to emphasise the fact that the pensioners in the neighbourhood of Leeds will not be adversely affected in any way by the change, as an area office and medical boards will continue to be maintained in that city. I should not be justified in maintaining the two regions as separate units in view of the administrative economy and advantages which will result. The total staff in the Yorkshire regional headquarters, which numbers less than 300, has shown a decrease of 75 during the past six months, and will continue to decrease. It is proposed to effect the transfer gradually in the autumn, and I hope that it will be possible to house the two staffs in the existing premises at Newcastle without removing the area office. I understand that the Office of Works have other premises available for housing the income-tax office.

Nationality of Pension Doctors.

Mr. Becker asked the Minister of Pensions if, seeing that Scotland, Wales, and Ireland insisted that doctors appointed by the Ministry were of their own nationality, he would see that, in future, the doctors appointed in England should be English; and would he give preference in selecting these medical men to ex-Service doctors.—Major Tryon replied: The assumption on which this question is based is not correct. In making these appointments the first consideration is efficiency and, subject to that, it is and always has been the policy of the Ministry to give preference to those who have served. I may add that 91 per cent. of the whole-time medical officers employed by my department have served.

Medical Examinations in Nottingham.

Mr. Hayday asked the Minister of Pensions where it was proposed to medically examine the aged dependents of deceased Service men who were resident in Nottingham and its vicinity; and whether arrangements would be made for them to be examined at their own homes or in proximity thereto.—Major Tryon replied: The existing arrangements, which will be continued, provide for these examinations to be made at area headquarters, Nottingham, or at the homes of the applicants when they are not in a condition to travel.

Pitch Cancer.

Mr. David Williams asked the President of the Board of Trade the number of men certified as suffering from pitch cancer by those engaged in the manufacture of pitch and patent fuel during the past five years; how many had died of this disease during the same period; and how many employed in those industries had died in the same period from other forms of cancer; and whether, in view of the growth of this disease, he would make it obligatory on the manufacturers of these commodities to use mechanical appliances in the handling of pitch wherever possible.—Mr. Bridgeman (Home Secretary) replied: The numbers of men reported to the Factory Department as suffering from this disease during the five years 1918 to 1922 were as follows:—In 1918, 23; in 1919, 10; in 1920, 25; in 1921, 18; and in 1922, 15. No fatal cases were reported in 1918 to 1920; two were reported in 1921, and one in 1922. Before 1920 the disease was not compulsorily notifiable under the Factory Act, but cases were notified under a voluntary arrangement. As the hon. Member will observe, the figures do not indicate any growth in the incidence of this disease. I regret that no information is available to show the number of deaths in these industries during the period in question from other forms of cancer. As regards mechanical appliances, I understand that these are generally used when practicable, but that they can only be used in a few operations. I am advised that the most effective precautions against this disease are great attention to personal cleanliness and periodic medical examination, and that facilities to enable the worker to take these precautions have been arranged for at the instance of the Factory Department at all the works concerned.

MONDAY, JULY 2ND.

Panel Doctors' Certificates.

Mr. Lowth asked the Minister of Health whether he had received any communications from Poor-law guardians or other bodies or persons respecting the acceptance or otherwise of panel doctors' certificates for Poor-law relief cases; and whether he would issue such instructions to Poor-law authorities that panel doctors' certificates might be accepted.—Mr. Neville Chamberlain replied: The reply to the first part of the question is in the negative, and, as at present advised, I see no occasion for the revision of the existing regulations on this subject.

Cancer Mortality.

Commander Oliver Locker-Lampson asked the Minister of Health if, having regard to the increasing prevalence of and mortality from cancer in the British Isles, he would consider the advisability of initiating in every local area under his control special machinery to investigate and, if possible, discover its cause and cure, the expenses of such machinery to be defrayed by a local rate.—Mr. Neville Chamberlain replied: I am giving attention to the increasing prevalence of and mortality from cancer and the action which central or local public health authorities may be able to take in the investigation of the cause and cure of this disease. As at present advised, however, I do not consider that the establishment in every area of special machinery financed out of local rates as suggested in the question would be desirable.

Arm-to-Arm Vaccination.

Mr. Rhys Davies asked the Minister of Health whether he was aware that, at the present time, many medical practitioners still employed the arm-to-arm method of vaccination in private practice; and whether, in view of the serious risks attending that practice, he would consider the desirability of making representations to the medical profession on the matter.—Mr. NEVILLE CHAMBERLAIN replied : The answer to the first part of the question is in the negative. My information is that comparatively few medical practitioners now employ this method of vaccination, and I scarcely think it necessary to make representations to the medical profession on the matter.

Legacies to Hospitals.

The Finance Bill was considered on Report.

Viscount EDNAM moved a new clause providing that legacy and succession duty should not be leviable or testimentary bequests made to hospitals carried on in the public interest. He said that while the ordinary income of the hospitals had increased since 1913 by 67 per cent., ordinary expenditure had increased by 137 per cent. He was informed by the British Hospitals Association and the King Edward's Fund that the average cost to the Exchequer of the concession would not exceed £130,000. If the voluntary system broke down the whole of this extra expense would be thrown upon the State.

Major CADOGAN seconded. He said that so long as the voluntary system was able to increase the amount of money raised on behalf of the hospitals the House ought to encourage the system, which not only saved the tax-payer something between £3,000,000 and £4,000,000 a year, but undoubtedly functioned far more efficiently than any State agency could possibly do.

Sir T. INSKIP (Solicitor-General), replying to the debate, said that at the most sanguine estimate a sum of £200,000 was involved and that was spread over 950 hospitals. It was not because the Government could not afford this sum that they were unable to grant this concession, but mainly because they thought it was impossible to make distinctions between one charity and another, and that if the hospitals did work for the State, the proper course was for a grant to be made from State funds.

Viscount EDNAM said that the hospital authorities for whom he spoke did not wish to divide against the Government, and therefore he asked leave to withdraw his new clause.

The Labour party opposed the withdrawal of the clause, which was negatived on a division by 243 votes to 153—majority 90.

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POSITION PAGES.—Terms on application.

A COMFORT FOR INVALIDS.—The *Preston Guardian* for June 23rd contains an illustration and description of a combination of chairs and simple accessories which should prove useful to the invalid and to the infirm. The combination has been devised by Sir Charles Brown, F.R.C.S., F.R.C.P., who is nearing 87 years of age and has been compelled to sleep downstairs for the past 18 months. The basis of the arrangement is an American rocking chair, which can be fixed in either the extreme upright or horizontal position by means of a large wedge. The companion chair, which can be used in the day time as an ordinary chair, extends the seat of the rocking chair, and with the aid of cushions, bed-clothes, and a hot-water bottle, a comfortable bed can be devised. An arrangement of cords allows the invalid to arrange the hot-water bottle according to his wishes. A simple table is provided for taking meals.

Appointments.

FELDMAN, W. M., M.D. Lond., F.R.S. Edin., has been appointed Physician to St. Mary's Hospital for Women and Children, Plaistow.

KEITH, F. L., M.D., Ch.B. Aberd., D.P.H., Medical Officer of Health for St. Pancras.

Manchester Royal Infirmary: TWINING, E. W., M.R.C.S., L.R.C.P. Lond., Radiological Registrar; and NEWELL, R. L., M.D. Manch., F.R.C.S. Eng., Assistant Surgical Officer.

Vacancies.

For further information refer to the advertisement columns.

Barbados General Hospital.—Jun. Res. S. £250.

Barnstaple, North Devon Infirmary.—H.S. £170.

Belfast, Queen's University.—Lecturer in Pharmacology. £450.

Belgrave Hospital for Children, Clapham-road, S.W.—Hon. Radiologist. 50 guineas.

Bristol Mental Hospital.—M.O. and Pathologist. £400.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow, near Chester.—Med. Supt. £800.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Physician.

Dreadnought Hospital, Greenwich, S.E.—H.P. £150.

East African Medical Service.—M.O. £600.

East London Hospital for Children and Dispensary for Women, Shadwell, E.—Part-time Pathologist. £400.

East-street Welfare Centre, Walworth, S.E.—Hon. Clin. Assts. Hon. P. for Infants.

Gloucester City.—M.O.H. £1000.

Guy's Hospital Dental School.—Senior Dental O. and Clin. Tutor. £300.

Hospital for Consumption and Diseases of the Chest, Brompton.—H.P.

Hove Hospital.—Res. M.O. £200.

King's College Hospital, Denmark Hill, S.E.—Second Asst. Radiologist. £300.

London County Mental Hospital Service.—Seventh Asst. M.O. £440.

Manchester Royal Infirmary.—Asst. Director to Clin. Lab. £350.

Miller General Hospital for South-East London, Greenwich-road, S.E.—H.P. £150.

Northampton General Hospital.—Two H.S.'s. Each £200.

Preston, Lancs, County Mental Hospital, Whittingham.—Locum Tenens M.O. £8 8s. per week.

Queen Mary's Hospital for the East End, E.—Hon. M.O. for Radio-Electro-Therapeutic Dept.

Royal Dental Hospital, London.—Hon. Asst. Dental Surg.

Royal Naval Medical Service.—Surgeon-Lieutenants.

Salford Union Infirmary, Hope, Pendleton, near Manchester.—Third and Fourth Asst. Res. M.O.'s. Each £200.

Sheffield Royal Hospital.—Cas. O. Hon. Surg. Asst. Cas. O.

Stoke-on-Trent County Borough.—Asst. M.O. £500.

West African Medical Service.—M.O. £660.

Willesden Urban District Council.—Two Asst. M O.'s. £500 and £600 respectively.

Wrexham Infirmary.—H.S. £150.

Births, Marriages, and Deaths.

BIRTHS.

ALEXANDER.—On June 29th, at Cade House, Riverhead, Sevenoaks, the wife of J. Finlay Alexander, M.A., M.D. Camb., of a daughter.

KERR.—On June 27th, at Baghdad, Iraq, the wife of J. Fraser Kerr, L.R.C.P. & S. Edin., Civil Surgeon, Hillah, Iraq, of a daughter. (By cable.)

SPERO.—On June 26th, at Connaught-square, W., the wife of Dr. G. E. Spero, of a daughter.

MARRIAGES.

DONKIN—BATES.—On June 27th, at St. James', Paddington, Sir Bryan Donkin, M.D., F.R.C.P., of London, to Marie Louise, widow of Isaac Bates, of Belfast, and daughter of the late William Preston, of Wilmington, North Carolina, U.S.A.

HALE—COLES.—On June 26th, at Watford Parish Church, John Hale, M.A., M.B. Camb., to Elsie Ledbrooke, daughter of Mr. and Mrs. Walter S. Coles, of Oxhey View, Watford, and Standean, Sussex.

DEATHS.

LIDDON.—On June 26th, at Silver-street House, Taunton, Edward Liddon, M.D., aged 92.

PROUDFOOT.—On June 21st, at St. Clair-street, Kirkcaldy, Scotland, suddenly, Robert Butter Proudfoot, M.D., in his 65th year.

RATTRAY.—On July 2nd, suddenly, at Pemberton-gardens, Upper Holloway, Patrick Whyte Rattray, F.R.C.S., in his 64th year.

WHITTING.—On June 25th, Charles Edward Whitting, M.A., M.B. Camb., of Buxton, aged 25 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

medical history of the patient. And that also would be valuable when the patient was changing his medical practitioner. When they had some agreement on various points, then they would have to go into the question of remuneration, and he could give his hon. friends the assurance that this matter would be discussed in the House sooner or later, very probably in the course of the autumn session, because he thought it was most likely that further legislation would be necessary in order to put into operation the new arrangement to which they might come. As regarded the Spahlinger treatment, he understood that a movement was going on for the raising of a sum of money privately which, if successful—as he had some reason to hope it might be—would enable Mr. Spahlinger to produce his remedies in sufficient quantities to be available for experiment, and he would then send a supply over here, where they would be handed to the Ministry for examination. The process discovered by Dr. Dreyer, as to which they had much more complete information, was very encouraging in its results. It was the policy, however, of the Ministry to test out any remedy submitted to them which seemed at all hopeful. As to the new School of Hygiene, plans had been prepared and a site chosen near the University buildings. The school would be affiliated to the University of London, but it would be governed by a body for which a charter of incorporation was to be sought, and in the meantime the work would be carried on by a transitional executive committee with the concurrence of the Rockefeller Institute. That committee, of which he was ex-officio chairman, had to consider the possible amalgamation or coöperation with similar institutions; it would go on with the preparation of plans and probably begin the building of the institution itself. But, most important of all, it had to proceed with the appointment of a director. They hoped to be able to make an appointment before very long. With regard to the recommendations of the Cobb Committee in connexion with lunacy, there were two lines of progress which were engaging his attention. One was the prosecution of research into all forms of mental disease, which had been taken up with considerable enthusiasm by a number of local authorities; the other line was the treatment of incipient cases without certification. The Mental Treatment Bill attempted to make some progress in that direction.

The Vote was agreed to.

Pensions Disability Committee.

Mr. PIELOU asked the Minister of Pensions whether he could inform the House the composition of his Pensions Disability Committee; whether this Committee's findings had ever been published; and, if not, whether he would undertake to publish the result of the work of this Committee, especially that part that concerned the recommendations made to the doctors on the special boards in connexion with the examination of pensions for final awards.—Major TRYON replied: The Disability Committee is composed of the Presidents of the Royal Colleges of Physicians and Surgeons and of other distinguished physicians and surgeons, together with the chief medical officers of my department. The recommendations of the Committee with regard to the medical considerations which should be taken into account in determining the assessment of special classes of disability, in connexion both with conditional and final awards, are issued from time to time to all medical boards and medical officers concerned in the assessment of pensions. It would not be to the public advantage, in my opinion, to make a general publication of these recommendations of the Committee, which are of a purely technical character and deal with such questions as symptoms and diagnosis.

Changes in Pensions Headquarters in the North.

Mr. ALBERT ALEXANDER asked the Minister of Pensions whether it was proposed to amalgamate the Yorkshire regional headquarters of the Ministry with the northern regional headquarters, and to close the regional headquarters at Leeds; and, if so, what were the reasons for the proposed change. Similar questions were asked by Mr. F. JOWETT and Sir J. BUTCHER.—Major TRYON replied: The amalgamation of the northern and Yorkshire regions has been decided upon as a measure of administrative reform. I wish to emphasise the fact that the pensioners in the neighbourhood of Leeds will not be adversely affected in any way by the change, as an area office and medical boards will continue to be maintained in that city. I should not be justified in maintaining the two regions as separate units in view of the administrative economy and advantages which will result. The total staff in the Yorkshire regional headquarters, which numbers less than 300, has shown a decrease of 75 during the past six months, and will continue to decrease. It is proposed to effect the transfer gradually in the autumn, and I hope that it will be possible to house the two staffs in the existing premises at Newcastle without removing the area office. I understand that the Office of Works have other premises available for housing the income-tax office.

Nationality of Pension Doctors.

Mr. BECKER asked the Minister of Pensions if, seeing that Scotland, Wales, and Ireland insisted that doctors appointed by the Ministry were of their own nationality, he would see that, in future, the doctors appointed in England should be English; and would he give preference in selecting these medical men to ex-Service doctors.—Major TRYON replied: The assumption on which this question is based is not correct. In making these appointments the first consideration is efficiency and, subject to that, it is and always has been the policy of the Ministry to give preference to those who have served. I may add that 91 per cent. of the whole-time medical officers employed by my department have served.

Medical Examinations in Nottingham.

Mr. HAYDAY asked the Minister of Pensions where it was proposed to medically examine the aged dependents of deceased Service men who were resident in Nottingham and its vicinity; and whether arrangements would be made for them to be examined at their own homes or in proximity thereto.—Major TRYON replied: The existing arrangements, which will be continued, provide for these examinations to be made at area headquarters, Nottingham, or at the homes of the applicants when they are not in a condition to travel.

Pitch Cancer.

Mr. DAVID WILLIAMS asked the President of the Board of Trade the number of men certified as suffering from pitch cancer by those engaged in the manufacture of pitch and patent fuel during the past five years; how many had died of this disease during the same period; and how many employed in those industries had died in the same period from other forms of cancer; and whether, in view of the growth of this disease, he would make it obligatory on the manufacturers of these commodities to use mechanical appliances in the handling of pitch wherever possible.—Mr. BRIDGEMAN (Home Secretary) replied: The numbers of men reported to the Factory Department as suffering from this disease during the five years 1918 to 1922 were as follows:—In 1918, 23; in 1919, 10; in 1920, 25; in 1921, 18; and in 1922, 15. No fatal cases were reported in 1918 to 1920; two were reported in 1921, and one in 1922. Before 1920 the disease was not compulsorily notifiable under the Factory Act, but cases were notified under a voluntary arrangement. As the hon. Member will observe, the figures do not indicate any growth in the incidence of this disease. I regret that no information is available to show the number of deaths in these industries during the period in question from other forms of cancer. As regards mechanical appliances, I understand that these are generally used when practicable, but that they can only be used in a few operations. I am advised that the most effective precautions against this disease are great attention to personal cleanliness and periodic medical examination, and that facilities to enable the worker to take these precautions have been arranged for at the instance of the Factory Department at all the works concerned.

MONDAY, JULY 2ND.

Panel Doctors' Certificates.

Mr. LOWTH asked the Minister of Health whether he had received any communications from Poor-law guardians or other bodies or persons respecting the acceptance or otherwise of panel doctors' certificates for Poor-law relief cases; and whether he would issue such instructions to Poor-law authorities that panel doctors' certificates might be accepted.—Mr. NEVILLE CHAMBERLAIN replied: The reply to the first part of the question is in the negative, and, as at present advised, I see no occasion for the revision of the existing regulations on this subject.

Cancer Mortality.

Commander OLIVER LOCKER-LAMPSON asked the Minister of Health if, having regard to the increasing prevalence of and mortality from cancer in the British Isles, he would consider the advisability of initiating in every local area under his control special machinery to investigate and, if possible, discover its cause and cure, the expenses of such machinery to be defrayed by a local rate.—Mr. NEVILLE CHAMBERLAIN replied: I am giving attention to the increasing prevalence of and mortality from cancer and the action which central or local public health authorities may be able to take in the investigation of the cause and cure of this disease. As at present advised, however, I do not consider that the establishment in every area of special machinery financed out of local rates as suggested in the question would be desirable.

Arm-to-Arm Vaccination.

Mr. RHYS DAVIES asked the Minister of Health whether he was aware that, at the present time, many medical practitioners still employed the arm-to-arm method of vaccination in private practice; and whether, in view of the serious risks attending that practice, he would consider the eye—to serve as an example. A critic of Darwin said he would as soon believe that a handful of words falling at random on a table could arrange themselves in the form of a perfect poem as that the parts of the eye had been assembled by chance. In 1903 Dr. W. H. Lewis commenced a series of experiments on developing tadpoles of a particular species, and found that when the optic cup, which forms the retina, grows out from the brain it comes against the overlying ectoderm or skin of the embryo. When the optic cup makes this contact the overlying ectoderm begins to form a lens. By transplanting the optic cup, Dr. Lewis found it had the power to compel the overlying ectoderm of any part to form a lens. Embryologists, by adopting the methods used by bacteriologists, have been able to demonstrate that some tissues of the embryo exercise controlling influences over other tissues. The pattern in which epithelial cells grow is altered when cells of a connective tissue nature are added. It is clear that we are now on the threshold of a new field of knowledge—one which presents us with a vista of an infinite complexity of mechanisms which regulate development and growth. The manner in which new and useful adaptations come into existence, or are evolved, will become apparent as we get to know the nature of such mechanisms.

We have known for many years that developing nerve cells have the power to send out processes which effect distant contacts with exceeding accuracy. But the knowledge that groups of neuroblasts have a power of migrating is new; and is, to a large extent, the result of researches carried out by Dr. Kappers of Amsterdam. These migrations affect groups of nerve cells concerned in a common function; such a group moves towards a site which is advantageous for the purpose it is to serve in the mechanism of the central nervous system. A change in position of this kind may be described as purposive. What influence propels or attracts these nerve groups or centres towards new sites we do not know, but the power and inclination to migrate during embryological stages are clearly part of the machinery of the evolution of the brain. The peculiar adaptational mechanisms of man's body are best studied in connexion with the development of his muscles. The musculature of the face and of expression of the higher primates represents a graduated series. The degree to which the facial muscles of man are differentiated is but the culminating phase of a series of advancing stages. Differentiation of the muscles of expression keeps time with the elaboration of the brain. The bud or embryonic nucleus which gives rise to the muscles of the face is formed locally below the ear from the substance of the hyoid arch. From this sub-auricular point the embryonic muscle cells spread outwards or migrate into all parts of the face, head, and neck, each group reaching and arranging themselves in their proper stations. Clearly the migratory power of young muscle cells—whatever be the nature of the influence which controls them—is part of the machinery of adaptation and evolution. The latissimus dorsi is another muscle which illustrates the migratory power of embryonic muscle cells; in this case they migrate from the neck to the loins.

The power of apparent automatic action seen in all kinds of cells in the early development of embryonic tissues is lost as fœtal stages of growth are reached. Certain wandering cells, like leucocytes, retain this archaic property of automatism. Bone cells, too, retain a high degree of adaptability to new conditions. How they react so as to buttress a bending bone is well known. But bone cells, and also cartilage cells, when they proceed to lay down the outlines of bones and joints, must be coördinated in their action to an exceedingly fine degree. For when they have completed their work, as in the bones of the hand, a harmoniously working contrivance has been produced. The properties of embryonic bone and cartilage cells constitute part of the machinery of evolution.

It is when we seek for the evolutionary machinery which has given rise to such a delicately balanced mechanism as is seen in the human spine that we realise how complex such a machinery must be. The bone cells which are laying down the levers attached to each vertebra, the muscle cells arranging themselves to act on these levers, the nerve cells grouping themselves in the spinal cord, and in the brain in order to coördinate the action of the vertebral muscle, are all working towards a common, harmonious end—the maintenance of the human spine in the walking posture. Clearly any adaptational change must affect every one of the millions of diverse units concerned in this functional result. That the human spine has been evolved there can be no doubt, but where is the machinery which transformed the ape's spine into that of man?

The Theory of Hormones.

I know of only one theory which assists one to explain such evolutionary occurrences, and that is the theory of hormones as propounded by Starling in 1905. He was in no doubt as to the nature of the discovery he had made. He clearly realised that hormones formed the basis of all evolutionary progress; hormones are the means by which social life amongst the oldest and simplest of unicellular organisms is rendered possible; it is an elaboration of this system of hormonic intercommunication which makes a colony of sponge zooids possible. In the assemblage of cells which constitute the body of the human embryo we see a colony apparently governed by a system of hormones—automatic in its constitution, yet so involved and intricate that it will take centuries of research to unravel the manner of its working. The key to evolution is a knowledge of how one group of embryonic cells influences and compels another group to produce a functional result. The means used are chemical missives or hormones.

The hormone system of government—like the nervous system, which is a structural extension of the older hormone mode of government—is founded on a reflex basis. Everyone knows that, if the muscular system of a man be exercised or trained, all the other systems of his body—his bones, lungs, heart, arteries, organs of digestion also undergo a responsive growth. We cannot explain such a response unless we postulate a hormone system—one which supposes that active muscles throw out missives, and that these missives evoke a reflex growth response in structures like the bones, heart, and lungs, which are accessory in action to the muscles. Acromegaly is a morbid manifestation or disorder of the mechanism which brings about the adaptational growth-response of exercise and of training. In acromegaly we find that the pituitary gland is always involved. This gland is apparently one of the chief coördinating centres—a sort of hormone brain—of the archaic coördinating system. Missives issuing from contracting muscles evoke reflexly from the pituitary certain substances which, passing into the circulation, act on accessory structures, such as the heart, lungs, and bones.

A specimen in the Museum of Charing Cross Hospital throws a clear light on the growth-regulating machinery of the human body. It is the skull of a boy who died after an operation to arrest the growth of a tumour-like swelling on the right side of his face. As may be seen from the specimen, the over-growth is most sharply and definitely limited to one functional system of the face and head—that which is concerned in mastication. On one side the teeth, jaws, and the bony struts which support the jaws, all the parts which give support to, or are acted on, by the muscles of mastication, are markedly overgrown. The condition was congenital. We cannot explain such manifestations—for the case cited is by no means unique—unless we suppose that the growth mechanisms which regulate the assembling and deploying of cells in the embryo is constituted on a functional basis. Structures concerned in a common function are correlated by a common growth mechanism.

Automatic Properties Retained by Embryonic Cells.

John Hunter gave utterance to a great truth when he said that there remained in our vascular and bony tissues the automatic properties to be seen in the lowest forms of organised life, such as the hydra. In the formative period of the human embryo—in the phase when adaptational contrivances are being worked out in the heart, brain, bone, and muscle—the embryonic cells still retain many of the automatic properties of primitive unicellular organisms. Herbert Spencer was also right when he said that if we would understand the evolution of government and adaptation in the developing animal body, such as that of man, we would do well to study first the evolution of government in a people rising from barbarism to civilisation. In the earlier stages of the evolution of human society we see that the machinery of government is represented by the automatic working of a herd-instinct—an instinct which tends to work for the good of the community. The instinct is biased in the direction of producing functional or effective results. We have to study what in our ignorance we must call the herd-instincts of that vast community which makes up the body of a human embryo, if we would understand how the structural contrivances of the human body have been evolved. I, for one, believe with Huxley that the government which rules within the body of the embryo proceeds uninfluenced by the occurrences which affect the body of the adult. Man has come by his great gifts—his brain, his upright posture, his nimble hand—not by any effort of his own; he has fallen heir to a fortune for which neither he nor his ancestors have laboured. The human body is the vehicle of a colossal and absorbing evolutionary experiment.

HEALTH CONDITIONS IN SOMALILAND.

THE medical report for 1921 shows that during the year 4492 cases of tropical ulcers were recorded, as compared with 4651 in 1920, and cases of scurvy fell from 55 to 22. Of malaria 145 cases were reported, as against 257 in the previous year. The subtertian is the commonest type identified. A steady decline in malaria can be noted year

Notes, Comments, and Abstracts.

TELEOLOGY AND EVOLUTION.[1]

BY SIR ARTHUR KEITH, M.D. ABERD., F.R.C.S. ENG., F.R.S.,
CONSERVATOR OF THE MUSEUM AND HUNTERIAN PROFESSOR, ROYAL COLLEGE OF SURGEONS OF ENGLAND.

TELEOLOGY, a word so familiar to the generation which read the works of Archdeacon Paley, has disappeared from the vocabulary of men of science. The things for which the word stood, the numerous contrivances to be seen in the human body, still remain; indeed, as we get to know the human body better its contrivances become not less, but more wonderful. Most people believed that Darwin had explained how such contrivances had arisen, but Huxley, although convinced that Darwin's main thesis was true, held a peculiar opinion as to the exact manner in which useful contrivances or adaptations came into existence.

The Doctrine of Evolutionary Predestination.

Any opinion held by Huxley regarding the structure of man was of real value. He had been a student of human anatomy at two periods of his career—first when studying medicine at Charing Cross Hospital, from 1842 to 1846, and then later, during the crisis raised by Darwin's "Origin" in the sixties of last century, he again made the evolution and nature of man his main theme of interest. In 1876, when he was in his fifty-first year and at the zenith of his intellectual ability, he had to lecture in Glasgow, and selected the hand as the theme of his discourse—a structure which Sir Charles Bell made the subject of a Bridgewater treatise. The old teleologists regarded the contrivances of the hand as of supernatural origin. Huxley admitted the excellency of its contrivances, but held they were neither the result of supernatural interposition nor were they functionally acquired characters. He held there was no evidence to support the belief that a child's hand could be influenced in size or action by hard manual labour on the part of its parents. "To be a teleologist" he said, "and yet accept evolution, it is only necessary to suppose that the original plan was sketched out and that the purpose was foreshadowed in the molecular arrangements out of which animals have come." Here we find Huxley, the sanest and most gifted of men, preaching a doctrine of evolutionary predestination. For if we apply this abstract declaration to the hand, foot, or brain of man, it simply means that in Huxley's opinion the designs which have blossomed into existence during the evolution of our brains, feet, and hands, were already germinating in the corresponding parts of man's simian ancestor.

Strange as it may seem to laymen, this doctrine of an evolutionary predestination is held by most of the men who have traced the history of animals through long geological ages by the study of fossil remains. The evidence which accumulates relating to the origin of man's most outstanding features favours this view. Many of man's newest structural acquisitions represent phases which are transitional in the young of anthropoid apes. The hairlessness of the skin of mankind, the fairness of the complexion of Europeans, man's relatively big head poised on a small neck, a large brain, a small face and jaws, a human proportion in the segments of the limbs and in the joints of the fingers and toes are acquisitions of this kind. New human characters are foreshadowed in developmental stages passed through by apes. And that these developmental characters are new and have never been perpetuated into an adult stage until man's evolution took place, there can be no doubt. All the fossil primates of which we have any knowledge are marked, not by these fœtal characters, but by features of a reverse kind. Development is a double process—old ancestral features are recalled and new features are introduced. Business men know that capital is necessary for the development of a new and large undertaking. Nature made this discovery long ago; she places sufficient capital at the disposal of the fœtus of man and anthropoid to carry them through the nine months which are spent in the womb, and it is during this latent, preparatory period that new designs are introduced and elaborated.

If Huxley is right, then man's destinies lie hid in the potentialities of his germ-plasm. There may be some consolation in knowing that there is nothing we can say or do, eat or drink, which will alter our evolutionary destiny—except in so far as we may voluntarily select and favour certain types of man as breeders do. If we cannot compel Nature to produce the type of man we may be in search of, we can, if we are so minded, favour one of the many types which Nature tends to produce.

Human Life a Continual Experiment.

But our main consolation would lie in this: we are attempting in these passing centuries one of the great experiments of human history. Perhaps the greatest revolution which has affected human life and evolution followed the discovery of the uses of fire and its application to the preparation of human food. The human body had then its nourishment presented to it in a state which no animal body had experienced before. In these modern days the conditions of human life have been again revolutionised; we abide in cities and live in houses; we work in heated factories, we breathe air laden with fumes of diverse kinds, we eat artificially prepared and concentrated foods, many of a novel kind; we drink beverages containing alkaloids which were unknown to our ancestors. We cannot claim that our bodies are escaping certain effects produced by modern methods of life. Nature has not made our bodies fool-proof. It would be a relief to know that the source from which the new generations of mankind issue was beyond any source of permanent contamination. But is it?

Transmission of Defect.

Darwin records the case of a cow in which the eye was injured when with calf. The calf was born with the corresponding eye small and blind. An identical case has been recently recorded of a mare; one eye was injured when she was pregnant and the foal was born with the corresponding eye small and blind. These are apparently not coincidences, for certain well-known experiments, which have been carried out lately by Guyer and Smith, throw light on how such an injury is transmitted. They injected rabbits with a substance which has a selective and destructive action on the lens of the eye; many of the progeny of such rabbits had small and defective eyes. They found that the defect thus produced was hereditary; it could be handed on by the male alone. Somehow the actual germ-plasm of these rabbits had been reached, and that element which is concerned with the formation of the eye had been permanently damaged. Professor Stockard induced permanent changes in the germ-plasm of guinea-pigs by treating one generation of them to extreme and prolonged doses of alcohol. Dr. J. G. Adami has summed up the evidence on this matter in his "Medical Contributions to the Study of Evolution."

Although ordinary injuries, such as the amputation of a limb or finger, the removal of the foreskin, the rupture of the hymen, the docking of horses, dogs, or sheep, produce no apparent effect on the progeny, yet it is clear that certain substances can reach and injure the germ-plasm in such a way as to induce permanent localised defects in the progeny. It is possible that certain defects—such as contracted palate, deformed jaws, the narrowing and margination of the nasal aperture, the tendency to flat-foot, and torsion of the spine, which are so common in present-day Englishmen and were so rare in their prehistoric ancestors, are due to toxic or other substances now circulating in our bodies. Is the prevalence of shortsightedness in modern civilised populations to be ascribed to such a cause? All one can say now of these defects is that they are of recent origin, and represent features which are new to the human body. No doubt the little use made by modern people of their teeth and jaws have something to do with the appearance of these changes in their faces, but disuse alone cannot explain them.

It is one thing to produce a definite and permanent lesion of the germ-plasm; it is quite another thing to influence the germ-plasm in such a way as to make it produce a useful or contrived modification of the eye, or of the hand, or of the foot. Take the human teeth, for example. Each upper tooth fits against, or should fit against, a counterpart in the lower jaw. Yet the crowns of the teeth, the articulating or opposing dental surfaces, are perfectly formed long before they come into use. When they do come into use they become worn and deformed, yet such abrasion leads to no change in the shape of the teeth of the progeny. A study of the teeth of man and apes shows that there is a mechanism which controls the kind of pattern and relative size and shape of all the teeth. When a dentition is undergoing evolutionary strengthening, or if it is undergoing a reduction, each tooth suffers a change which affects the whole dental series in an orderly manner. The machinery which regulates the formation and evolution of teeth is one which cannot be influenced by any act or habit on the part of the parent. As Huxley declared, there is no evidence to lead us to believe that purposive modifications of structure can be produced by use. What, then, is the mechanism of their production?

Complexity of Mechanism of Growth.

Since Darwin and Huxley wrote, our conception of the machinery which controls the development of the embryo—and the machinery of development is also the machinery of evolution—has undergone a great extension. Let us take the development of that highly teleological organ—the

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[1] An abstract of the Huxley Memorial Lecture given at Charing Cross Hospital Medical School, June 27th, 1923. The lecture will be published in full in a future number of Nature.

Post-Graduate Lectures

ON THE

SURGERY OF THE THYROID GLAND.

LIBRARY

Delivered at the London Hospital on June 8th and 15th, 1923,

BY A. J. WALTON, M.S. LOND., F.R.C.S. ENG.,
SURGEON, LONDON HOSPITAL.

LECTURE I.*

THERE is hardly one, if indeed there is one, subject in medicine or surgery of which we can say that finality of knowledge has been reached. The inexactitude of our knowledge of the diseases of, or even of the normal condition of, the thyroid is especially noticeable, and the more we study this subject the more we realise how uncertain are our views and how we must be prepared to alter them as fresh evidence arises. It is manifestly impossible to discuss the whole subject in two lectures; I therefore propose to limit my remarks to the various forms of innocent overgrowth of the gland, for to such lesions surgical measures of treatment are most applicable. These overgrowths may for convenience be best classified as follows:—(*a*) Localised: adenomata and fibro-adenomata, cysto-adenomata, and pure cysts; (*b*) Diffuse: colloid goitre, adeno-parenchymatous goitre, and exophthalmic goitre or Graves's disease.

If such rare cysts as hydatids are excluded from the first group it will be found that all these lesions commence as pure adenomata; in the second group the adeno-parenchymatous is simply a combination of colloid goitre and adenomatous masses, although, as I shall show presently, there is a definite tendency for a colloid goitre to develop localised overgrowths. Hence, as Plummer has frequently insisted, there are really only three innocent overgrowths of the thyroid, although various combinations of such overgrowths frequently occur. These primary enlargements are adenomata, colloid goitre, and exophthalmic goitre.

ADENOMATA.

Pathology.

True adenomatous enlargements commence in a thyroid which is previously healthy and are definitely localised and encapsulated. This point must be emphasised because many of the localised overgrowths, especially those seen in *endemic* goitre and thus found in association with more diffuse changes, have a less well-defined capsule and are, in fact, often not adenomata at all. The true adenomata are frequently single, although not uncommonly two or three may be present. They occur in any part of the gland. In the early stages they form spherical masses of solid glandular tissue which show already a distinct fibrous capsule. They tend steadily to progress in size, but rarely reach the diameter of 1 inch without showing definite evidence of degeneration. The microscopic study of a small adenoma will show that it consists of vesicles lined by epithelium, cuboidal or flattened according to the size of the vesicle. These are much larger than normal, and may be 10 or 20 times the size of the vesicles seen in a healthy gland. In nearly all cases the characteristic feature is the irregularity in the size of the vesicles, many small vesicles being packed between those which are enlarged. As the vesicles increase the walls atrophy and the adjacent cavities run together. It therefore happens that an adenoma 1 inch or more in diameter nearly always shows areas of so-called colloid degeneration—that is to say, there are spaces perhaps *only* as large as a pea, perhaps 1 inch or more in diameter, which are filled with semi-fluid colloid material. This is the origin of the ordinary cystic degeneration of an adenoma, and in some cases the process may progress so far that the whole of the vesicular walls are destroyed and a pure cyst is left, formed of the original fibroid capsule and filled with fluid colloid material. During the destruction of the vesicular walls capillaries may be ruptured and hæmorrhage may take place into the cavity of the cyst. Hence the fluid is either brown in colour or is formed almost wholly of altered blood. At times the hæmorrhage is severe so that the cyst rapidly increases in size, and on removal is seen to contain a large quantity of blood. In the more chronic cases there is an increase of fibrous tissue in the capsule or in the septa. Such a change may be excessive, so that the adenoma in very large part is formed of fibrous tissue, giving rise to the so-called fibro-adenoma. At other times there are calcareous changes within the fibrous tissue, and it is not at all uncommon in old adenomata to find small areas which grate when the tissue is cut and which consist of a calcareous deposit, or sometimes indeed of true bone. This calcareous change may be so excessive that the whole capsule is converted into a stony membrane which does not collapse when the tumour is incised. Another very important and not infrequent change is the formation of the so-called thyrotoxic or fœtal adenoma. Plummer[24] was the first to direct attention to this condition, although Langhans[15] had previously laid considerable stress upon a condition which he described as proliferating goitre. In such fœtal adenomata a naked eye section will show that the tumour has a much more fleshy or granular appearance. In fact, the cut surface will much more resemble that of an exophthalmic goitre than of a normal thyroid. Microscopically it will be seen that the section is made up of solid masses of cells which are often small and embryonic in type, and if arranged in lobules show a very small amount of stroma between. 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Speese and Brown[25] investigated a series of 28 cases of malignant disease and found that 19 of these arose in previous adenomata and that the average time that elapsed before the adenoma showed malignant changes was $12\frac{6}{10}$ years. It was interesting to note also that in five of these cases of carcinomata toxic manifestations of the adenoma were present before there was definite malignant change. Wilson[27] believes that practically all malignant tumours arise from this variety of fœtal adenomata. In a later communication he[28] investigated the complete literature of this subject and found that there were 193 malignant tumours in a series of 74,335 collected necropsies. Of 97 cases in the Mayo Clinic 50 were only diagnosed by pathological section after removal. Of a further 290 cases in the same clinic only 61 had not noticed a previous thyroid enlargement. He says that if the enlargements are due to circumscribed proliferation of the parenchymatous tissue they are adenomata. If they remain encapsulated and slowly degenerate they are benign. If they are associated with symptoms of slowly developing hypermetabolism with cardiac disturbances they are toxic non-exophthalmic goitre, the toxic adenomata of Plummer. If they continue to proliferate they penetrate their capsule, invade and metastasise, and are then malignant. He points out that histologically it may be almost impossible to differentiate the fœtal adenomata from the carcinoma. He therefore lays by year. There were 113 cases of relapsing fever, compared with 64 in 1920. The distinct form of this fever noted in a previous report as confined to Burao, and apparently carried by the bed-bug, has died out. There were recorded 32 cases of small-pox (all contracted outside the Protectorate), 82 of influenza, 132 of dysentery, 719 of syphilis, and 406 of gonorrhœa. There were 186 cases of tuberculosis with 21 deaths, as against 263 cases with 24 deaths in 1920. The decrease in poverty amongst the natives due to peaceful conditions and good seasons probably accounts for the decline in this disease. The health of European officials shows a considerable improvement. Only 14 Europeans were placed on the sick list (a percentage of 1·1 to the average number resident), and these cases all occurred in Berbera. The total number of patients admitted to hospitals was 1262, as against 1998 in 1920, whilst the out-patients numbered 19,119 as compared with 17,145.

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*Lecture II. will appear in a forthcoming issue of THE LANCET.

HEALTH OF GOVERNMENT OFFICIALS IN WEST AFRICA.

THE Colonial Office, in a report issued on June 14th (obtainable from the Crown Agents for the Colonies, 4, Millbank, London, S.W. 1. Price 6*d*.) draws attention to the continued improvement in the general standard of health among non-native Government officials in West Africa. So far no adverse effects appear to have resulted from the longer tours of service under the new regulations. The number invalided out of the service in 1922 was equivalent to a rate of 20·8 per 1000 as compared with 16·6 in 1921; in spite of this increase, the rate was lower than that for any year prior to 1921, with the exception of 1917, when it was 20·5. On the other hand, the death-rate last year fell to 8·0 per 1000, a decrease by one-third on the rate for 1921, and the lowest on record. The decrease was particularly marked in the Gold Coast, where the rate per 1000 was 10·5 in 1922 as compared with 20·0 in 1921, and in Nigeria, where it was 6·9 as compared with 8·4. The average number of non-native officials in service during 1922 was 3220—viz., 58 in Gambia, 206 in Sierra Leone, 946 in the Gold Coast, and 2010 in Nigeria.

The West African Medical Service forms a separate branch of the Colonial Medical Service, and details as to appointments, leave and passage, private practice, pensions and gratuities, and instruction in tropical medicine, as published periodically by the Colonial Office, appear annually in the Students' Number of THE LANCET.

CHILDREN'S COUNTRY HOLIDAYS FUND.

To the Editor of THE LANCET.

SIR,—As chairman of the London County Council, and on behalf of the children of London, I appeal for support for the Children's Country Holidays Fund. Through the medium of the fund many of our elementary school-children are enabled to benefit both physically and mentally by a fortnight's holiday in the country. It is not necessary to dwell upon the importance of the fund, but I feel that it would be a real danger if, owing to the falling off in the subscriptions, the number of children sent to the country were restricted. For the year 1923, owing to the financial position of the fund, it has been necessary to estimate for about 4000 fewer children than were sent away last year. This is the ground of my appeal, and whilst appreciating the number of calls which must be made upon the generosity of those who support the fund, I feel sure that there need be no children disappointed of their summer holiday if those to whom the objects of the fund commend themselves will assist according to their ability. Donations should be made payable to the Children's Country Holidays Fund, and should be sent to the secretary at 18, Buckingham-street, Strand, W.C. 2.

I am, Sir, yours faithfully,
HENRY C. GOOCH,
June 29th, 1923. Chairman of the London County Council.

PROFESSIONAL AND BUSINESS WOMEN'S HOSPITAL LEAGUE.

THIS friendly society, whose registered office is at 195–197, Edgware-road, London, W. 2, was founded in 1913 to make provision in severe sickness for women who earn their living by professional or business work. By means of contracts with certain hospitals arrangements are made for beds in private wards to be available for members of the League who live near London, provincial members who are unable to come to town for treatment being aided by a money grant. The annual subscription for ordinary members is 5*s*. The League is now in a flourishing condition, having more than doubled its membership during the past year.

It has been found necessary to limit the age of those joining the League as new ordinary members to 55; on the other hand, a class of student members has been constituted. A new feature of the League's activities is an arrangement whereby a firm of surgical instrument makers allows to members of the League a considerable discount off surgical appliances.

PEOPLE'S LEAGUE OF HEALTH.

AT an emergency meeting of the Medical Council of the People's League of Health, held at their headquarters, 12, Stratford-place, W. 1, it was resolved that a letter should be sent to the Council of the British Empire Cancer Campaign welcoming the establishment of that body, and suggesting a meeting of representatives of that council and members of the Medical Council of the People's League of Health, with the object of determining in what way the League could coöperate in the important work, the resolution passed by the council being: "That in view of the prevalence of cancer, the People's League of Health urges that a cancer survey of Great Britain would be advisable." In July, 1920, the subject of an international cancer survey was discussed by the Medical Council of the League. In view of the great financial stringency prevailing at that time consequent upon the war it was then decided that further action should be postponed. It is on an international basis, through the organisations and institutions with which the League is in touch in India, China, Japan, Australia, Italy, France, Belgium, Czecho-Slovakia, and the United States of America, that the People's League of Health is hoping to be of use to the Council of the British Empire Cancer Campaign.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, July 12th.

DERMATOLOGY: at 5 P.M. (Cases at 4.30 P.M.)
Cases will be shown.

Tuesday, July 17th.

GENERAL MEETING OF FELLOWS: *at 5 P.M.*
Ballot for election to the Fellowship.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE POST-GRADUATE LECTURES, 1, Wimpole-street, W.
WEDNESDAY, July 11th.—5.30 P.M., Mr. H. S. Souttar: The Surgery of Intracranial Tumours.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, July 9th.—10 A.M., Mr. Maingot: Surgical Pathology. 2.30 P.M., Dr. Saunders: Medical Wards. 3 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 3 P.M., Dr. Pernet: Skin Dept.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Bishop Harman: Eye Dept. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 11 A.M., Dr. McDougal: Electrical Dept. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.
THURSDAY, July 12th.—4.30 P.M.: Dr. R. Worth: Demonstration of Mental Cases at the Springfield Mental Hospital.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Demonstration of Clinical Cases at 3.30 P.M.
MONDAY, July 9th.—Medical: Dr. J. Browning Alexander.
TUESDAY.—(3 P.M.) Surgical: Mr. Howell Evans.
WEDNESDAY.—Eye Cases: Mr. Norman B. B. Fleming.
THURSDAY.—Surgical: Mr. H. W. Carson.
FRIDAY.—Diseases of Children: Dr. C. E. Sundell.

LONDON HOSPITAL MEDICAL COLLEGE, Mile End, E.
WEDNESDAY, July 11th.—4.15 P.M., Dr. W. M. Feldman: The Physiology of the Infant.
FRIDAY.—4.15 P.M., Mr. H. S. Souttar: Intracranial Tumours.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, July 12th.—4 P.M., Dr. Pearson: Indigestion after Infancy.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, July 12th.—5 P.M., Mr. L. C. Rivett: Still-birth.

Post-Graduate Lectures

ON THE

SURGERY OF THE THYROID GLAND.

Delivered at the London Hospital on June 8th and 15th, 1923,

BY A. J. WALTON, M.S. LOND., F.R.C.S. ENG.,
SURGEON, LONDON HOSPITAL.

LECTURE I.*

THERE is hardly one, if indeed there is one, subject in medicine or surgery of which we can say that finality of knowledge has been reached. The inexactitude of our knowledge of the diseases of, or even of the normal condition of, the thyroid is especially noticeable, and the more we study this subject the more we realise how uncertain are our views and how we must be prepared to alter them as fresh evidence arises. It is manifestly impossible to discuss the whole subject in two lectures; I therefore propose to limit my remarks to the various forms of innocent overgrowth of the gland, for to such lesions surgical measures of treatment are most applicable. These overgrowths may for convenience be best classified as follows:—(*a*) Localised: adenomata and fibro-adenomata, cysto-adenomata, and pure cysts; (*b*) Diffuse: colloid goitre, adeno-parenchymatous goitre, and exophthalmic goitre or Graves's disease.

If such rare cysts as hydatids are excluded from the first group it will be found that all these lesions commence as pure adenomata; in the second group the adeno-parenchymatous is simply a combination of colloid goitre and adenomatous masses, although, as I shall show presently, there is a definite tendency for a colloid goitre to develop localised overgrowths. Hence, as Plummer has frequently insisted, there are really only three innocent overgrowths of the thyroid, although various combinations of such overgrowths frequently occur. These primary enlargements are adenomata, colloid goitre, and exophthalmic goitre.

ADENOMATA.

Pathology.

True adenomatous enlargements commence in a thyroid which is previously healthy and are definitely localised and encapsulated. This point must be emphasised because many of the localised overgrowths, especially those seen in endemic goitre and thus found in association with more diffuse changes, have a less well-defined capsule and are, in fact, often not adenomata at all. The true adenomata are frequently single, although not uncommonly two or three may be present. They occur in any part of the gland. In the early stages they form spherical masses of solid glandular tissue which show already a distinct fibrous capsule. They tend steadily to progress in size, but rarely reach the diameter of 1 inch without showing definite evidence of degeneration. The microscopic study of a small adenoma will show that it consists of vesicles lined by epithelium, cuboidal or flattened according to the size of the vesicle. These are much larger than normal, and may be 10 or 20 times the size of the vesicles seen in a healthy gland. In nearly all cases the characteristic feature is the irregularity in the size of the vesicles, many small vesicles being packed between those which are enlarged. As the vesicles increase the walls atrophy and the adjacent cavities run together. It therefore happens that an adenoma 1 inch or more in diameter nearly always shows areas of so-called colloid degeneration—that is to say, there are spaces perhaps only as large as a pea, perhaps 1 inch or more in diameter, which are filled with semi-fluid colloid material. This is the origin of the ordinary cystic degeneration of an adenoma, and in some cases the process may progress so far that the whole of the vesicular walls are destroyed and a pure cyst is left, formed of the original fibroid capsule and filled with fluid colloid material. During the destruction of the vesicular walls capillaries may be ruptured and hæmorrhage may take place into the cavity of the cyst. Hence the fluid is either brown in colour or is formed almost wholly of altered blood. At times the hæmorrhage is severe so that the cyst rapidly increases in size, and on removal is seen to contain a large quantity of blood. In the more chronic cases there is an increase of fibrous tissue in the capsule or in the septa. Such a change may be excessive, so that the adenoma in very large part is formed of fibrous tissue, giving rise to the so-called fibro-adenoma. At other times there are calcareous changes within the fibrous tissue, and it is not at all uncommon in old adenomata to find small areas which grate when the tissue is cut and which consist of a calcareous deposit, or sometimes indeed of true bone. This calcareous change may be so excessive that the whole capsule is converted into a stony membrane which does not collapse when the tumour is incised. Another very important and not infrequent change is the formation of the so-called thyrotoxic or fœtal adenoma. Plummer[24] was the first to direct attention to this condition, although Langhans[15] had previously laid considerable stress upon a condition which he described as proliferating goitre. In such fœtal adenomata a naked eye section will show that the tumour has a much more fleshy or granular appearance. In fact, the cut surface will much more resemble that of an exophthalmic goitre than of a normal thyroid. Microscopically it will be seen that the section is made up of solid masses of cells which are often small and embryonic in type, and if arranged in lobules show a very small amount of stroma between. Bloodgood[2] and Goetsch[10] have both called attention to the fact that in the normal thyroid there are two types of cell. There are those forming acini with a more or less definite basement membrane and certain interstitial epithelial cells which lie loosely between the acini. Meleney[23] has shown that it is these interstitial cells especially which are so increased in the formation of the fœtal adenomata. The importance of this change lies in the effects of such cellular overgrowth. McCarrison[16] regards these cells as reserve parenchymatous cells from which new acini are formed as required. In their more embryonic state they may, when they proliferate, not only give rise to hyperthyroidism, but may, indeed, closely resemble in appearance a carcinomatous change. The difficulty in making a differential diagnosis is increased by the fact that not infrequently this variety of tumour does in fact become true carcinoma. Speese and Brown[25] investigated a series of 28 cases of malignant disease and found that 19 of these arose in previous adenomata and that the average time that elapsed before the adenoma showed malignant changes was $12\frac{6}{10}$ years. It was interesting to note also that in five of these cases of carcinomata toxic manifestations of the adenoma were present before there was definite malignant change. Wilson[27] believes that practically all malignant tumours arise from this variety of fœtal adenomata. In a later communication he[28] investigated the complete literature of this subject and found that there were 193 malignant tumours in a series of 74,335 collected necropsies. Of 97 cases in the Mayo Clinic 50 were only diagnosed by pathological section after removal. Of a further 290 cases in the same clinic only 61 had not noticed a previous thyroid enlargement. He says that if the enlargements are due to circumscribed proliferation of the parenchymatous tissue they are adenomata. If they remain encapsulated and slowly degenerate they are benign. If they are associated with symptoms of slowly developing hypermetabolism with cardiac disturbances they are toxic non-exophthalmic goitre, the toxic adenomata of Plummer. If they continue to proliferate they penetrate their capsule, invade and metastasise, and are then malignant. He points out that histologically it may be almost impossible to differentiate the fœtal adenomata from the carcinoma. He therefore lays down the dictum that any sizable adenoma composed of embryonal tissue, if in a patient of cancer age, is potentially malignant although still contained entirely within the capsule.

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* Lecture II. will appear in a forthcoming issue of THE LANCET.

Ætiology.

Although histologically these tumours appear to be simple adenomata they manifestly differ very considerably in many particulars from adenomata elsewhere. They frequently occur in association with endemic and colloid goitre. As will be shown later they very often have a definite function and may give rise to hyperthyroidism. They also react very considerably with the needs of the body tissue, and thus are often found enlarged during pregnancy and menstruation. The single localised adenomata may possibly be due to the same factors that give rise to more general enlargements, but the evidence on this point is much less clear. There is, however, a very distinct family history. In my own series of 155 operated cases there were 21 in whom other members of the family, usually sisters or brothers, were affected. In such cases there was usually more than one other affected member in the family, and thus it is possible, just as with the endemic and colloid goitres, that this is not an hereditary fault but that all the children and perhaps the parents are exposed to the same faults, whether they be toxic or dietetic. The researches of Kocher and McCarrison seem to show that single localised adenomata are relatively rare in the endemic areas. As with all other varieties of thyroid enlargement the female sex is much more frequently affected than the male. In my own series there were 14 males and 141 females. The age of onset is somewhat later than that of the colloid goitres, and in my own series many first noticed the tumour between the ages of 30–40. Like the colloid condition, however, the change is often first noticed at puberty.

Symptoms.

A small, localised mass occurring in one lobe of the thyroid may be present for many years, and beyond causing the patient a certain amount of annoyance from its unsightly appearance may give rise to no symptoms. Very often, however, a patient who is afflicted, even with a relatively small adenoma, will complain of a considerable amount of pain and discomfort. The majority seek advice chiefly on account of the increasing deformity. In my own series this symptom was complained of in nearly every case, but it was the sole complaint in 30 cases only. When the tumour has reached a considerable size the deformity may be very great, and when it is sufficiently large to attract the notice of the patient's friends may cause considerable annoyance. If pain alone is complained of, it would seem often to be more imaginary than real. The patient will state that there is a pricking sensation in the throat and that there is pain in swallowing. At other times she will complain of pain commencing in the tumour itself, radiating widely up the neck and passing to the head. Only on rare occasions is it noticed, when other symptoms are absent, that there is a feeling of localised heaviness and pressure. If there is a sudden increase in size from the presence of a hæmorrhage, the pain may be considerably increased.

The most important symptom, and the one which most frequently demands intervention, is that of pressure upon the surrounding structures, especially upon the trachea. When the tumour has reached a certain size there is always some dyspnœa; this symptom determines the necessity of operative interference. In some cases it may be very slight or only present upon exertion, so that if the patient is able to lead an easy and comfortable existence it will cause little disability. When the adenoma is placed posteriorly, or if there be two adenomata, one in each lobe, the pressure and resulting deformity is likely to be more marked and the dyspnœa will then be increased. In some cases, indeed, it may have progressed so far before treatment is sought that the patient may have difficulty in sleeping, and may have to lie in bed with her head and shoulders well propped up. If there has been any sudden increase in size, either from hæmorrhage or from some inflammatory change, the dyspnœa will be rapidly increased and may become a serious and dangerous symptom. The condition is much more marked if an adenoma in the lower part of the thyroid has grown downward and become fixed within the thoracic entry. Such a condition, which is usually described as a retro-sternal goitre, is relatively rare. In Berry's[1] series of 500 cases it was only present in 22. Under such conditions the dyspnœa may be most alarming. During expiration the mass may be forced up in the neck and the air may escape with comparative ease, but during inspiration it is drawn down, the trachea is further obstructed, and there is great difficulty in the air entering the lungs. It is well to remember that dyspnœa with a thyroid adenoma may not be due to the visible tumour. A patient may have a prominent adenoma in front of the thyroid and yet the dyspnœa may be entirely due to a second adenoma seated more posteriorly or to an intrathoracic growth which is barely visible. Some of these retrosternal goitres may, indeed, on an ordinary examination, be entirely overlooked, although as a rule they will be pushed up into the neck during forced expiration, such as occurs on coughing. Some, however, may be only diagnosable after an X ray examination of the upper portion of the thorax. Fortunately, these large and more fixed growths have not uncommonly undergone a calcareous change, so that they will give a well-defined shadow on an X ray examination. Other pressure symptoms are relatively uncommon. Now and again patients will complain of difficulty in swallowing, but such a symptom is rare. Occasionally a simple adenoma may be accompanied with alterations in the voice from pressure upon the recurrent laryngeal nerve. It is well to remember this, for it used to be believed that the presence of such symptoms was a clear indication of carcinomatous changes.

Adenomata of long standing are not uncommonly associated with some evidence of hyperthyroidism. Special stress has been laid upon this change, for it has often been claimed that the good results of the surgical treatment of exophthalmic goitre are due to the inclusion of a large number of these cases which can be operated upon with practically no risk. Plummer[24] was the first to clearly differentiate between these two conditions. As a rule the changes do not develop until the adenoma has been in existence for many years. Judd[12] found that in a series of 100 cases the toxic symptoms only developed after an average period of $19\frac{4}{12}$ years, and in Sistrunk's[25] series only after an average period of 16 years. Haggard and Dunklin[11] found that a large number of their cases developed such symptoms, but they were usually only present in patients between the ages of 35 and 40. They also laid stress upon the fact that such symptoms were very likely to be induced by the administration of iodine, which is so often given to elderly women with long-standing goitre. Although in these cases there is a very definite evidence of hyperthyroidism, this is, as a rule, incomplete. The cardiovascular system is usually more affected, the pulse is increased in rapidity, and later is often irregular; there is evidence of cardiac dilatation, and auricular fibrillation may be present. Although there may be a small amount of tremor the nervous system is always affected to a less degree than in true Graves's disease. It is occasionally stated that there may be some degree of exophthalmos, but in my own series I have never been able to find any true eye changes with a toxic adenoma. It must be remembered here that a patient who has true Graves's disease—that is, a cellular proliferation of the whole of the thyroid gland—may also have an adenoma. In such a case, which must be sharply distinguished from a toxic adenoma, the characteristic nervous and ocular symptoms of true Graves's disease will be present. In these cases of fœtal adenomata the basal metabolic rate is never increased to the same degree as with true Graves's disease. Haggard and Dunklin[11] found, for instance, that in their series it was raised by about 35 per cent., as compared with a 66 per cent. average increase in Graves's disease. Moreover, after operation it rapidly falls, so that it is only increased by 7 per cent. within two weeks of operation. In the later stages there will not infrequently be evidence of renal degeneration.

Treatment.

If these adenomata of the thyroid gland were ætiologically comparable with adenomata elsewhere, an operation would be indicated in them all, for being true tumours no other treatment would be available: they would steadily increase in size, there would be the danger of sudden enlargement and dyspnœa, and of the onset of malignancy. It has been my aim, however, to show that in many ways these tumours differ from true adenomata, and hence the general surgical rules are not applicable. I would regard as indications for operative interference:—

1. *Failure to Obtain Relief by Medical Measures.*—If, when first seen, the tumour is associated with a diffuse enlargement, medical treatment should always be tried. It may happen that the adenomatous mass will entirely disappear, but even in the more unsatisfactory cases the general enlargement will lessen and the size and shape of the adenomata will become better defined. It is my custom also in all cases in which the adenoma is soft and ill-defined to try a course of medical treatment. In such cases the mass is less likely to be a true tumour, and not uncommonly very considerable improvement, if indeed not a complete cure, may be obtained by such measures. If, however, the tumour is very hard and sharply defined, which usually means that there is either some degenerative change in the wall of the adenoma or that it has been converted into a cyst, then, manifestly, no medical measures will bring about a cure.

2. *A Steady Increase in Size with Resulting Deformity.*—If these tumours are very small, and give rise to no disability, no operation need be undertaken, but in such cases a careful watch should be kept upon the patient, and this is more especially so if she is over the age of 30. In fact, if a tumour has been in existence for many years, and the patient is 35 years or more, an operation should be advocated, especially if there be the slightest evidence of any toxic symptoms, for it is these cases that are so likely to become malignant in later years. If the tumour is so large that it causes a definite deformity, operation is clearly indicated. There is, perhaps, one exception to this statement, and that is if the patient be pregnant. Unless there be very urgent dyspnœa, no operation should ever be *undertaken* for a goitre during pregnancy. It is astonishing to what an extent an enormous goitre seen in the later months of pregnancy may diminish in size within a month or two after the confinement or after the completion of lactation.

3. *The Presence of Dyspnœa.*—This is the chief and most important indication for operative interference, and even if it does not greatly interfere with the patient's life it is evident that pressure is being caused and that the tumour is enlarging. Should difficulty in breathing be so marked, or should the patient's employment be such that her work is seriously interfered with, the necessity for operation will be much more urgent. If the disease has been allowed to progress so far that the patient cannot sleep on lying down, the operation should be undertaken as soon as possible, for at any time an attack of severe dyspnœa may occur, and if it takes place at night it may give rise to a fatal result before help can be obtained. Acute temporary attacks of suffocating dyspnœa are probably due to hæmorrhages and are a clear indication of the urgent need of operative treatment. The presence of a retro-sternal goitre causing dyspnœa will call for interference as soon as possible, for the longer the condition is left the greater the danger and the more difficult the operation.

4. *Other Pressure Symptoms.*—Evidence of pressure upon the recurrent laryngeal nerve, blood-vessels, or œsophagus is usually evidence of the rapid increase in size of the adenoma, and is therefore an indication for removal.

5. *Presence of Pain.*—A complaint of pain without other symptoms is rare, but sometimes it may be an indication of early carcinomatous changes, and in any case, if it be sufficient to cause the patient discomfort, operation should be undertaken at an early date.

6. *Presence of Hyper-Thyroidism.*—Not only are toxic changes a considerable danger to the patient, but, as has already been pointed out, such cases are more likely to undergo carcinomatous change. An operation should therefore be strongly urged. It is remarkable to what an extent the grave discomfort which is caused by the toxæmia will improve by operative treatment. Unless degenerative changes have already been set up in the heart and kidneys the whole of the symptoms will frequently disappear within two or three weeks of removal of the tumour.

In performing an operation upon an adenoma many precautions will have to be taken. As a routine measure ether will always be the anæsthetic of choice. Chloroform for any goitre operation is a dangerous drug. If there be many toxic symptoms large quantities of fluid and a prolonged rest in bed will often be a valuable preliminary of operation. These measures will, however, be discussed more fully when operations for exophthalmic goitre are considered. If there be pressure symptoms the anæsthesia should be very light. Under such circumstances the intratracheal ether held out great hopes, but it cannot be said to have fulfilled expectations. Crotti[3] has laid stress upon the defects of this measure, which he says has often proved unsuccessful because of the necessity of anæsthetising before passing the tube. Extreme hyper-extension of the head is required and occasionally the tube may fail to pass beyond the obstruction. The operation of choice is that of enucleation of the adenoma. In actual practice, however, this is only carried out with very small adenomata. The larger tumours are so firmly adherent and have so greatly thinned out the front of the thyroid that a wedge of this anterior surface is usually excised and the adenoma then shelled out from the thyroid tissue behind. To this operation Berry has given the name of resection-enucleation, and it is unquestionably the operation of choice, for it removes only the tumour and leaves behind all the normal thyroid tissue. After removal the cavity of the thyroid gland is closed with a running mattress suture which obliterates the cavity and completely controls all hæmorrhage. It is always advisable after such an operation to insert a small tube for 24 or 48 hours. No harm is done by such a measure, and the resulting scar is practically invisible. In certain cases where an adenoma is very large and limited to one lobe the tissue of that lobe may be so destroyed that a hemithyroidectomy may be required, but this is only the case in exceptional circumstances. Where the adenomata are many and are associated with a diffuse enlargement, a modification of the wedge resection—which will be described as the operation for colloid goitre—may be requisite. The greatest technical difficulties are found in operations for a retro-sternal goitre. Fortunately, however, these goitres receive all their blood-supply from above, so that the vessels passing down to the goitre can be all ligatured and divided before the removal is essayed. It is in the delivery of the mass from within the thorax that the greatest difficulty and danger may be encountered, for at such a time pressure upon the trachea is greatly increased.

Results of Operation.

The results of operative treatment on these lines are extremely satisfactory. The danger of operation is almost non-existent, and if it were not for the presence of long-standing hyperthyroidism with its cardiac degeneration, or of severe pressure such as is seen in the retro-sternal goitres, there would be practically no mortality. In my own series there were three deaths in 155 cases, and in all these cardiac changes were advanced. The after-results, too, are extremely satisfactory. Single adenomata practically never recur, but if they are multiple, and especially if there be any diffuse change in the gland, a more guarded prognosis must be given. Not only is the mortality of operation very considerably higher, but the adenomata are more likely to recur, so that now and again cases will be met with in which, a year after operation, the goitre is as large as before.

Colloid Goitre.

The colloid goitre, or, as it often used to be called, the parenchymatous goitre, differs from an adenoma in so far as the change is diffuse and not limited to one small section of the gland. Two types of the disease are described, the endemic and the sporadic, but it is probable that there is no real difference in these two conditions. In certain areas, such as Switzerland and in the Gilgit and Chitral Valleys, the work of Kocher and McCarrison[19] has shown that the disease is so widespread that a very high proportion of the population may be severely affected by the disease. It is probable, however, that in these places the same causative factors are only present to a more marked degree. In England the disease is now widespread, and although it is still the custom to describe areas where it is endemic, it is very doubtful whether a much higher proportion of cases is situated in these areas. The actual frequency in England is difficult to ascertain, as so many cases are of a minor degree which do not require any operative interference. More advanced examples form, however, a very large proportion of the cases attending hospital out-patient departments, so that unquestionably the disease is very widespread. In the endemic areas it is a most serious menace. Oswald of Zurich states that 1900 Swiss recruits are discarded each year for low stature, which is due in part to a cretinoid state, and that there were 50,000 cretins recognisable at sight. McCarrison[16] found that in some Himalayan villages the disease was so common that it was difficult to find a man, woman, or child not suffering from the deformity. In India as a whole, at the time he wrote, there were not less than 5 million persons afflicted with goitre, while ½ million was a low estimate of the numbers who suffered from its congenital manifestations. He also states that in some Himalayan villages as many as 60 per cent. of infants still at the breast have been found to be goitrous.

Pathology.

The essential pathological change as found in young girls in England is a diffuse enlargement of the whole thyroid gland. The normal shape is more or less maintained, the surface is smooth with large vessels running beneath the capsule and shows no nodular enlargement. The increase in size may be very considerable, a lateral lobe not infrequently being 5 in. in length and 3 in. in width and thickness. The gland is much firmer in substance, and on cut section has a characteristic appearance. The surface consists of small globules which are visible to the naked eye, the appearance being somewhat similar to that of a sago pudding. It is yellow-pink in colour and not very vascular. On microscopic section there is an enormous increase of colloid material. The vesicles are dilated to 30 or 40 times their normal diameter and are filled with colloid. The material differs from that of a normal gland in that it is much more readily stained with eosin. The lining membrane of the dilated acini consists either of a single layer of cuboidal cells or of cells which have become flattened from the pressure of the colloid. The inter-acinar cells are seen in clumps between the dilated acini and are not increased in number. In England the pathological changes do not as a rule progress beyond this, but if the condition has been long in existence further changes may take place in one of three directions: (1) Degeneration of the thyroid tissue; (2) formation of localised adenomatous masses; or (3) a diffuse proliferation passing on to Graves's disease.

In the first condition the acinar walls may break down, masses of colloid may collect, or there may be evidence of a chronic inflammatory change passing on to fibrosis and even to hyaline and calcareous degeneration. If these degenerative changes proceed to an extreme degree the patient may become myxœdematous and the thyroid will then decrease in size and may be replaced by a fibrous atrophic mass. In long-standing cases it is not uncommon for rounded or circumscribed masses to develop apart from the main tissue of the thyroid. These are sharply defined and appear to be adenomatous, but they rarely have the same well-defined capsule as is shown by the true adenomata. McCarrison regards them as degenerative masses which arise from the inter-acinar cells and as an attempt on the part of the thyroid to replace that portion which has undergone atrophy. Hence, in the endemic areas large nodular thyroids, which in this country are often described as the adenoparenchymatous type, are common. The adenomatous masses themselves, just like the simple adenomata, will show varying changes. There may be a colloid degeneration with the formation of cystic-like spaces; there may be masses of fibrous or calcareous tissue or there may be a large cellular proliferation giving rise to toxic symptoms just as in the isolated fœtal adenomata. McCarrison[16] has also shown that in the areas where the goitre is endemic repeated periods of hyperplasia occur during succeeding springs, the gland reverting in the interval to the colloid state.

Under certain conditions the epithelium lining the acini will proliferate, the amount of colloid material will diminish, and the whole gland will become much more cellular. The patient will then develop symptoms of hyperthyroidism, and in this country it is not at all uncommon to find cases of true Graves's disease which have commenced as a simple colloid goitre. Wilson[29] and McCarthy[21] have shown quite clearly that there is a very definite relationship between the amount of hyperthyroidism and the degree of cellular proliferation, so that it is possible to accurately foretell the pathological picture from the nature of the clinical symptoms. Curiously enough, in areas where goitre is endemic true Graves's disease is relatively uncommon, and Eggenberger[5] says that in Switzerland at least half of the cases of Graves's disease are attributable to the excessive medical prescription of iodine. McCarrison[16] also has noted that Graves's disease is rare in regions where goitre is endemic, and in the Himalayan valleys he had seen comparatively few cases in ten years, although the disease was not infrequent among the European residents in such localities.

Ætiology.

An hereditary factor in the colloid goitres is even more marked than in the cases of adenomata, and in my own series it was present in 11 out of 41 operated cases. A further interesting fact has also been noted: there have been several cases in which colloid goitre has been associated with deaf-mutism, and under such circumstances those members of the family who were deaf and dumb also showed goitres, the remaining members being free from both disabilities. McCarrison[16] has laid special stress upon this hereditary factor, and he has found that it is especially common among the Syeds, who, being descendants of the Prophet, are permitted to marry only among their own sect. He states that this factor is much more marked in sub-thyroidic persons than others, for in the true goitre it is difficult to tell what is the effect of heredity because exciting causes which produce it in the parent produce it also in the fœtus or the child. The sex influence is a very marked factor, but it is of interest to note that in endemic areas this influence is only noticed after puberty. In quite young children the sexes are equally affected. In this country the majority of colloid goitres appear in young girls at the age of puberty, although the change may persist until long after this age. In my own series 79 per cent. of the cases occurred in women, and in nearly all of these the onset was between the ages of 15 and 20. The close relationship of the enlargement to sexual changes has long been noted. Not only is the condition much more common at the age of puberty, but there is a tendency for an enlargement of the thyroid to occur during menstruation and to a greater degree during pregnancy. This is not uncommonly seen in otherwise normal women, but if they are the subjects of goitre the increase in the size of the gland is much more manifest. It is well known that under such conditions there is not only an increase in the size of the gland but there is a hyperactivity, and thus women who suffer from a mild hypothyroidism are always at their best throughout the course of a pregnancy. Occasionally goitres may be found at birth or even in young children. In this country such a condition is rare. Berry[1] found that in his series of 500 cases the youngest were five girls aged 14. In my own series one patient was aged 13 and three were 14. As has already been pointed out, however, in endemic areas congenital goitres are quite common. Among sporadic cases there is very little definite relationship between the presence of goitre in the parents and cretinism in the children. In the endemic areas this relationship is very constant. It has already been mentioned what a high proportion of the Swiss population are cretinoid, and McCarrison has made some very interesting observations in the endemic areas in India. He has shown that cretinism does not occur until the second or third generation of a goitrous family, and that it appears to be more common in certain families, especially those who are ill-nourished. Consanguinity also plays an important part. Curiously enough, males were more commonly cretinoid than the females, the proportion being 5 of the former to 2 of the latter. This relation is still maintained even among cretins who are goitrous, but it is less marked, the proportion being 5 to 4. Forty-four per cent. of all cretins in these areas are also goitrous, but usually the goitre is acquired subsequently to the onset of symptoms of cretinism. Moreover, cretins are more likely to develop goitre than normal children, 70 per cent. over the age of 10 having also a goitre. The importance of the hereditary influence is shown by the fact that a goitre was present in 96 per cent. of the mothers of cretins.

Cause.

The older views that goitre was in some way associated with the geological formation, in so far as it was more common in mountainous districts, have had to be very considerably modified. It was believed that in these areas the water was impregnated with lime and that an increase of this substance was the causal factor in giving rise to the enlargement of the thyroid. These views have now been definitely shown to be incorrect. Endemic goitre is by no means limited to mountainous districts or to limestone formations, and there are many high areas in which goitre is practically unknown. An investigation of the functions of the thyroid is more likely to give a clue to the cause of the enlargement. It has long been realised that the thyroid secretion contains a large quantity of iodine. In 1914 Kendall was able to isolate the active principle in a crystalline form, and he has also been able to prepare it synthetically. He has shown that this substance, which he calls thyroxin, contains 65 per cent. of iodine. When administered it acts very slowly, so that its action does not commence for many hours, and after it has commenced continues for about three weeks. In 1895 Baumann devised his method of measuring minute quantities of iodine in the thyroid secretion. He was then able to demonstrate that the percentage of iodine contained in goitrous glands was much diminished, although in large goitres the total amount of iodine might be above that of the normal gland. De Quervain[4] has shown that if rats are given thyroid secretion they become hypersensitive to an oxygen deficiency. By this means he was able to work out the activity of the various forms of goitre, and he showed that the colloid goitres contained much less active principle than exophthalmic goitres. Eggenberger[5] has pointed out that the iodine in the air and water speedily decreased in passing from the sea coast to the upland interior, and that near the sea there was ten times as much as in Switzerland. McClendon and Williams have also shown that there is an inverse ratio between the amount of iodine in the surface waters and the distribution of goitre. It has thus come to be generally believed that a colloid goitre is due to a deficiency of iodine in the water and food. Such an explanation alone would not, however, account for the much greater frequency of this disease in women and its exacerbation during periods of sexual activity. The work of McCarrison[17] has done much to throw light upon this discrepancy. He has shown that deficiency in feeding has a very marked effect in producing colloid enlargement. Pigeons fed on an excess of fat had an increase in size of the thyroid which was due to colloid excess with little or no increase of the epithelium. If raw onions were added to their diet there was an increase of the acinar epithelium. If the birds were also fed upon cod-liver oil there was a very complete freedom from the development of a goitre. He sums up all his experimental work by showing: (1) That a thyroid hyperplasia is readily produced by the use of a diet deficient in iodine; (2) iodine in minute doses will prevent and cure goitre when administered at the proper time and season. Nevertheless, a goitre will often arise when there is plenty of iodine in the food. In other words, a sufficiency may become an insufficiency under certain conditions. The adequate absorption and assimilation of iodine is influenced by gastro-intestinal infection, and the needs of the thyroid for iodine are dependent upon many factors. Excess of fats, for instance, will increase these needs, but there are many other factors, such as sex, age, puberty, sexual activity, pregnancy, menstruation, infections, seasons of the year, &c. In other words, the goitre is usually due to an inability of the thyroid to avail itself of the iodine which is present, or the iodine is insufficient for abnormal demands.

The importance of infection in increasing the demands of the thyroid for iodine, or in preventing its proper assimilation, has of late had very considerable stress laid upon it. McCarrison has carried out a great deal of work on these lines, and has proved that in many of the endemic areas goitre is due to an infection in the water-supply. He has been able not only to produce goitre in human subjects and animals experimentally, but also able to cure already existent goitres by overcoming the infection which is present. The work of Farrant[6] is also of very considerable interest from this point of view. He showed that the various forms of infection are associated with definite changes in the thyroid gland, the acute infections giving rise to absorption of colloid with infolding of the epithelium and a cellular increase—that is, to a pathological change similar to that found in exophthalmic goitre. This occurs with a bacterial infection, or may be produced in animals injected with a toxin—that is to say, it is an antitoxin reaction. In the later stages, and in the more chronic infections, the gland involutes. Large spaces filled with colloid are formed, which spaces vary in size as new ones are continually being formed. Later on fibrosis occurs, the vesicles are destroyed, the gland becomes cirrhotic, and areas of hyperplasia or fœtal adenomata may be formed. The relationship between these two pathological changes is of very considerable importance, for it will be seen that a goitre of the colloid type may merge into one in which there is a proliferation of the epithelium with consequent hyperthyroidism—that is to say, a simple goitre may pass into the much more serious condition of Graves's disease. The factor which appears most likely to cause this change is the careless administration of iodine. Kocher[14] long ago recognised this, and issued a warning against the treatment of lesions of the thyroid by means of iodine and thyroid extracts. Although the greater part of the evidence at our command suggests that the above is the chief cause of a colloid enlargement, there are certain facts that throw doubt upon it. It has long been realised by surgeons that in those cases where an operation is indicated for the relief of dyspnœa the removal of a extremely satisfactory. Single adenomata practically never recur, but if they are multiple, and especially if there be any diffuse change in the gland, a more guarded prognosis must be given. Not only is the mortality of operation very considerably higher, but the adenomata are more likely to recur, so that now and again cases will be met with in which, a year after operation, the goitre is as large as before.

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Ætiology.

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I investigated a series of out-patient cases on these lines, and the results were very interesting. Twenty cases were treated with regular doses of the syrup of iodide of iron and 20 with intestinal antiseptics alone. About 50 per cent. of each group were cured. If the two treatments were combined a further 40 per cent. were greatly benefited, thus supporting McCarrison's view that an excess of iodine may be insufficiently absorbed if intestinal sepsis be present. There is no doubt, therefore, that each case must be considered apart, and that the administration of iodine will have to be combined with attention to the diet and the care in eliminating any form of sepsis and especially intestinal sepsis.

There are, however, certain cases in which surgical treatment is indicated, but it must be remembered that this is always exceptional. The first clear indication is the presence of dyspnœa. Even in such circumstances an operation should only be undertaken if the dyspnœa is sufficient to cause discomfort, if it is steadily progressive, and especially if it interferes with the patient's sleep. The second indication is the presence of multiple adenomata. Since these masses are not true adenomata but are secondary to the general change, an operation should not be performed unless medical treatment has been tried. Moreover, such measures must always be continued after the operation or the condition will recur.

The onset of hyperthyroidism, if it is not controlled by medical treatment, is also an indication for operative treatment. The case will then pass from this group into that of Graves's disease, where the indications for operation will be more fully considered. In certain cases where the disease has existed for a long period and has proved refractory to all forms of medical treatment, an operation may be undertaken as a means of overcoming deformity, but it must be remembered that such cases are exceptional.

In cases of the above type where an operation is essential the same preparation and the same precautions in the use of the anæsthetic will be taken as in cases of adenomata. It was formerly the custom to to perform a hemi-thyroidectomy, removing one lobe and half the isthmus. There are, however, several drawbacks to this operation. If the thyroid is very much enlarged removal of one side only may lead to an increase in deformity of the trachea, and thus may not only fail to relieve but may actually increase the dyspnœa. As a general rule a hemi-thyroidectomy is followed by a rapid decrease in the size of the remaining half of the thyroid, but in certain cases the other lobe may not diminish or may even increase in size. Under such circumstances the deformity is considerably exaggerated, for a lateral enlargement is more noticeable than one that is symmetrical. The operation, therefore, of choice is that of a double wedge-resection combined with division of the isthmus. Free access is gained to the thyroid gland by means of a long collar incision. The pre-tracheal muscles are preferably divided and the whole of the thyroid is exposed. The isthmus is divided down to the trachea and dissected free, so that all pressure upon this structure is removed. Each lobe is grasped by the assistant so as to control all hæmorrhage. A wide wedge with its base anterior is excised from each lobe in turn, and the wide gap which is left is sutured together with a running mattress suture of catgut which controls all hæmorrhage and restores the lobe to shape. The reconstructed lobes are then dropped back into position, a small tube is inserted, the muscles are sutured, and the wound is closed. Should there be multiple adenomata the wedge will have to be modified, and after the elliptical incision is made in front of the enlarged lobe the individual adenomata will be shelled out with the wedge instead of making a clean incision. If there be any evidence of hyperthyroidism or manifest toxic changes an operation of the above type may be associated with too much risk. Under these circumstances there will be less danger, less trauma and hæmorrhage, if a partial thyroidectomy be performed. These cases should, in fact, be treated not as simple colloid goitres, but as cases of Graves's disease. The same preparations will be made for operation, and the same technique will be carried out.

Results of Operation.

The results of operation in this type of goitre are not quite as satisfactory as those of adenomata. This is due to the fact that an operation is only carried out in the presence of some complication, whereas with an adenoma removal is often called for when the patient's condition is quite good. In my own series of 42 cases there were two deaths. One of these was due to the fact that the trachea was absolutely flattened and after removal showed a valvular collapse on inspiration. An attempt was made to overcome this by intubation of the trachea, but the patient collapsed rapidly and died a few hours later. In spite of the danger of infection of the wound I believe it would have been better in this case to have performed a subsequent tracheotomy as giving a freer air entry. The other case showed a considerable amount of toxic change and hyperthyroidism, although the changes were not sufficient for the case to be included among those of exophthalmic goitre. The more simple goitres will usually make very good progress after operative treatment, but should there be any adenomatous masses it is always necessary to carry out post-operative medical treatment or the enlargement will recur and obstruction again become manifest.

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portion of the thyroid either in the form of a wedge resection or as a hemithyroidectomy is, in the majority of cases, followed by a rapid diminution in the size of the remaining portion of the thyroid. This, together with the pathological appearance, which consists of dilated acini with deeply-standing colloid material, suggests that the disease is not so much one of overgrowth and secretion of the thyroid, but rather of a damming up of its secretion within the thyroid gland. This would also account for the fact that so many of these cases show a hypo- rather than a hyper-thyroidism. Acting on this assumption in one case presenting dyspnœa, I operated by making a simple incision through each lobe. It was of interest to see that the operation was followed by a diminution of the size of the gland, which progressed into a complete cure. The progress was, however, so relatively slow as compared with that of a wedge resection, that it was not considered advisable to repeat it.

Symptoms.

The disease, as a rule, commences in this country as an enlargement of the thyroid gland, which is first noticed in girls at or about the age of puberty. At first it is very difficult to determine whether the enlargement is only physiological or pathological, and a large number of female children at this age show a distinctly enlarged thyroid which disappears within a few weeks or months. In fact, the size of the thyroid is so variable in women that it is often difficult to say what is its normal size. As the condition progresses the enlargement steadily increases, until it forms a noticeable swelling with very distinct characters. The whole gland participates, so that the normal outline is maintained. At this stage the enlargement is soft and ill-defined, so that on palpation it may be difficult to determine its exact outline. There is no visible pulsation of the overlying veins, there is little or no increase in the pulsation of the arteries, no thrill can be felt at the superior pole, and the enlargement is not tender. In such cases a family history is common. Children in this stage are often brought for advice because a small swelling has been noticed, and because the mother has feared trouble owing to the presence of goitre in other members of the family. Later the most important symptom is that of pressure upon the trachea. There will be the onset of dyspnœa of varying degree. At first this will only be found upon exertion, but later it may be present when the subject is at rest, and it may often interfere with sleep. Such patients may have severe suffocating attacks, and even a fatal attack, of acute dyspnœa at any time of day or night. Under such circumstances it will be found that the trachea is much flattened from side to side, so that it shows the well-known scabbard appearance. It is well to remember also that in such cases of extreme pressure there is not only a flattening of the trachea, but also a loss of elasticity from atrophy of the cartilaginous rings. The importance of this change lies in the fact that sometimes removal of the thyroid is insufficient to overcome the dyspnœa; the operation may, in fact, allow the trachea to collapse. Berry has laid stress upon this fact, and has pointed out that a tracheotomy may sometimes be necessary after a partial thyroidectomy. In my own experience this has only been necessary on two occasions. After the partial thyroidectomy the trachea was seen to collapse with every inspiratory movement, so that there was valve-like action with complete obstruction.

Colloid goitres, being as they are uniform in size and enlargement, are not usually associated with retrosternal masses, and hence dyspnœa from obstruction of the thoracic inlet does not occur. Later the nature of the thyroid enlargement may alter considerably, and there may appear in it nodular masses, sometimes very numerous, giving rise to the so-called adenoparenchymatous type. Under such circumstances dyspnœa may occur from a lateral distortion and displacement of the trachea, and there may be pressure upon surrounding tissues similar in nature to that occurring with the adenomata. As a general rule, a simple colloid goitre of this variety shows no symptoms of alteration in thyroid activity, or if any such symptoms are present they are more likely to be of the nature of a hypothyroidism. The relationship between this condition and cretinism occurring in the endemic areas has been mentioned. Sistrunk[26] has shown that with this variety of goitre the basal metabolic rate is either normal or a little below the normal, and this even if there were a certain amount of tachycardia and nervousness. At times, but usually only after a colloid goitre has been in existence for a considerable period, there may be evidence of hyperthyroidism. The general symptoms are, as a rule, the first to show the change. The patient will complain of palpitations and will be found to have a rapid heart-beat. She will become nervous and tremulous, and there may be slight exophthalmos. The thyroid will then be found to be much more vascular, there will be pulsation of the overlying veins, and often a thrill at the apex of the upper lobe. In other words, the condition has passed over to one of true Graves's disease. It is of very great importance to recognise the earliest onset of such a change, for under such conditions the administration of any form of iodine or thyroid preparation will be fraught with considerable danger.

At times very curious intermediate changes are found in long-standing colloid goitres which are difficult to explain either clinically or pathologically. The thyroid may lose its soft ill-defined outline and may become hard and sharply defined. In such conditions it appears to be adherent to the trachea and may be mistaken for a malignant change. The progress of the disease will show, however, that there is little or no change, and I have seen one such interesting case where the condition has been maintained unaltered for a period of over three years. In another such curious case the patient showed a large hard thyroid with evidence of very slight hyperthyroidism. At operation the gland was of almost stony hardness. Pathological reports of the removed portions stated there was a diffuse carcinoma, for the thyroid cells were found widely dispersed in the lymphatics. The gland remained enlarged and hard after the partial removal, but the patient commenced to develop slight evidence of myxœdema. The administration of small doses of iodine was followed by a rapid decrease in size of the thyroid until now it cannot be felt at all and the patient is a typical example of myxœdema who has to be constantly controlled by the administration of thyroid extract. The onset of true malignancy in cases of colloid goitre is extremely rare, and I doubt whether it ever occurs unless the gland has previously been the seat of multiple adenomata.

Treatment.

The treatment of this disease is in itself essentially medical. If taken at the correct period the enlargement can probably always be controlled by medical measures. This is more especially the case in young children and where there is some definite factor such as pregnancy. Under such conditions no operation should ever be considered unless there be the onset of some urgent complication. The treatment usually advised is the administration of iodine or thyroxin, and in the endemic areas it has been advocated that one of the iodides should be mixed in very small doses with common table salt and should in this manner be distributed to the general population, or should be given mixed with chocolate to young children. Such methods of widespread administration have, however, several drawbacks. Attention has already been directed to the fact that in the endemic areas such cases of Graves's disease that occur are usually due to over-administration of iodine, and there is unquestionably a very considerable danger in giving this drug if there is the slightest evidence of hyperthyroidism. Moreover, the work of McCarrison has shown that some other factor is often present, and that the administration of iodine alone may be insufficient.

I investigated a series of out-patient cases on these lines, and the results were very interesting. Twenty cases were treated with regular doses of the syrup of iodide of iron and 20 with intestinal antiseptics alone. About 50 per cent. of each group were cured. If the two treatments were combined a further 40 per cent. were greatly benefited, thus supporting McCarrison's view that an excess of iodine may be insufficiently absorbed if intestinal sepsis be present. There is no doubt, therefore, that each case must be considered apart, and that the administration of iodine will have to be combined with attention to the diet and the care in eliminating any form of sepsis and especially intestinal sepsis.

There are, however, certain cases in which surgical treatment is indicated, but it must be remembered that this is always exceptional. The first clear indication is the presence of dyspnœa. Even in such circumstances an operation should only be undertaken if the dyspnœa is sufficient to cause discomfort, if it is steadily progressive, and especially if it interferes with the patient's sleep. The second indication is the presence of multiple adenomata. Since these masses are not true adenomata but are secondary to the general change, an operation should not be performed unless medical treatment has been tried. Moreover, such measures must always be continued after the operation or the condition will recur.

The onset of hyperthyroidism, if it is not controlled by medical treatment, is also an indication for operative treatment. The case will then pass from this group into that of Graves's disease, where the indications for operation will be more fully considered. In certain cases where the disease has existed for a long period and has proved refractory to all forms of medical treatment, an operation may be undertaken as a means of overcoming deformity, but it must be remembered that such cases are exceptional.

In cases of the above type where an operation is essential the same preparation and the same precautions in the use of the anæsthetic will be taken as in cases of adenomata. It was formerly the custom to to perform a hemi-thyroidectomy, removing one lobe and half the isthmus. There are, however, several drawbacks to this operation. If the thyroid is very much enlarged removal of one side only may lead to an increase in deformity of the trachea, and thus may not only fail to relieve but may actually increase the dyspnœa. As a general rule a hemi-thyroidectomy is followed by a rapid decrease in the size of the remaining half of the thyroid, but in certain cases the other lobe may not diminish or may even increase in size. Under such circumstances the deformity is considerably exaggerated, for a lateral enlargement is more noticeable than one that is symmetrical. The operation, therefore, of choice is that of a double *wedge-resection* combined with division of the isthmus. Free access is *gained* to the thyroid gland by means of a long collar incision. The pre-tracheal muscles are preferably divided and the whole of the thyroid is exposed. The isthmus is divided down to the trachea and dissected free, so that all pressure upon this structure is removed. Each lobe is grasped by the assistant so as to control all hæmorrhage. A wide wedge with its base anterior is excised from each lobe in turn, and the wide gap which is left is sutured together with a running mattress suture of catgut which controls all hæmorrhage and restores the lobe to shape. The reconstructed lobes are then dropped back into position, a small tube is inserted, the muscles are sutured, and the wound is closed. Should there be multiple adenomata the wedge will have to be modified, and after the elliptical incision is made in front of the enlarged lobe the individual adenomata will be shelled out with the wedge instead of making a clean incision. If there be any evidence of hyperthyroidism or manifest toxic changes an operation of the above type may be associated with too much risk. Under these circumstances there will be less danger, less trauma and hæmorrhage, if a partial thyroidectomy be *performed*. These cases should, in fact, be treated not as simple colloid goitres, but as cases of Graves's disease. The same preparations will be made for operation, and the same technique will be carried out.

Results of Operation.

The results of operation in this type of goitre are not quite as satisfactory as those of adenomata. This is due to the fact that an operation is only carried out in the presence of some complication, whereas with an adenoma removal is often called for when the patient's condition is quite good. In my own series of 42 cases there were two deaths. One of these was due to the fact that the trachea was absolutely flattened and after removal showed a valvular collapse on inspiration. An attempt was made to overcome this by intubation of the trachea, but the patient collapsed rapidly and died a few hours later. In spite of the danger of infection of the wound I believe it would have been better in this case to have performed a subsequent tracheotomy as giving a freer air entry. The other case showed a considerable amount of toxic change and hyperthyroidism, although the changes were not sufficient for the case to be included among those of exophthalmic goitre. The more simple goitres will usually make very good progress after operative treatment, but should there be any adenomatous masses it is always necessary to carry out post-operative medical treatment or the enlargement will recur and obstruction again become manifest.

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INSURANCE PRACTICE:

A REVIEW WITH CERTAIN CRITICISMS AND CONSTRUCTIVE PROPOSALS.

By A. GARVIE, M.D. GLASG.

THE preparation of this paper suggested itself some weeks ago when the virulent attack was made by a certain medical coroner on panel practice, especially where practitioners were in possession of large panels. Being one who may be classed in that category, I have thought that a brief review might throw some light on a much-abused system. I regret the necessary introduction of personalities.

First it may be pointed out that to a very large extent the routine work of an insurance practice is something new in the annals of medicine. Medical art has more or less in the past been devoted to, if one may use motoring language, the repair of breakdowns; but with the introduction of the Insurance Act, carte blanche was given to any insured person not only to claim the services of his mechanic in a breakdown, but at any time when he thought the car was not in proper tune. There was nothing in the Act to prevent a man claiming Rolls Royce efficiency irrespective of personal abuse or the type of vehicle. Where that could not be obtained, he could grumble about the delinquencies of his mechanic and at the same time suggest that those delinquencies were due to the objectionable system of payment. Further, it is perhaps as well to recall that, previous to the introduction of the Insurance Act, the potentially insured were given to understand that they had merely to report a lack of tune to their medical adviser to draw freely on Insurance funds. As soon as the Act was passed the work of disillusionising them on this point was very promptly and very properly begun; unfortunately, though the politician practised the illusion, the onus of explanation was left to the physician, and too often, when the explanation was not considered satisfactory, the method of payment again came under discussion.

In bringing the work under review real difficulty has been found in fixing some standard on which it could be judged. Obviously, we know next to nothing of what is normal health, or what constitutes a restoration to normal health, for the disappearance of certain disagreeable symptoms does not always mean a status quo ante. On that basis no standard can be fixed. A comparison might be made with the work in private practice, the results in private practice for the time being held out as ideal, but when one comes to realise the number of faith-healing cults, patent-medicine vendors, bone-setters, herbalists, and the whole host of others downwards or upwards to the handy-women with their single box of salve, who had their large clientèle long before the Insurance Act came into force—these, whatever value they may have had, certainly demonstrated that a large number did not find the care of qualified medical men all-sufficient. Comparison is difficult, and more so because failure or transgression in private practice is put down to lack of ability or excusable forgetfulness; under the Insurance Act it is always "the panel." From the fact that the Ministry has asked for a record of the total number of attendances, it would appear that some value is attached to that, but it is the most futile of all standards. It places a premium on eye-service and inefficiency. One consultation of half an hour, where that appears necessary, may be of infinitely more value that 30 of three minutes' duration.

The Standard.

Some standard has been sought within the work itself and the following tests have been applied:—

(*A*) How far (1) loss of patient, (2) permanent disablement, (3) death of patient, may be assigned to (*a*) the system, and responsibility divided between the Ministry and approved societies on the one hand, and (*b*) the art of medicine, and the responsibility divided between the limitations of medical science and personal incapacity or delinquency.

(*B*) How far credit can be given to the system for cure or alleviation of the major illnesses of life acting through the agency of the faculty.

An attempt has been made to present a series of facts in as neutral a spirit as possible and little judgment has been passed, the writer preferring to leave that to others. Where the facts appear personally unfavourable no excuse is offered, for *qui s'excuse s'accuse.* One cannot argue from the particular to the general, but when a series of generalisations are applied to the particular and found wanting, then to a fair mind it suggests the need for revision.

Basis of Review.

Two thousand records of different insurance patients, accumulated during a period of slightly over five years, have been examined. During that time the total number of insured patients on the list has gradually increased to slightly over 2500—the limit fixed in this area—and has been subject to adjustment, a process again necessary. This does not represent the total number who have actually claimed benefit. The work on various occasions has been interrupted through absence and illness, but the interruption has always been to all intents complete; mere triviality of illness has not prevented a record being kept, for anyone caring to investigate primary symptoms will find that trivial illness is an expression very difficult of definition. In Table III. the analysis of disability, where this deficiency from the total actually seen has to be acknowledged, the symbol + has been used to represent a proportionate deficiency from some total figure which can be regarded as a constant, the figures thus retaining a relative value. Where the symbol is absent it may be taken that, as far as it has been possible to ascertain, those are the actual number of cases occurring during the period.

Influx and Efflux of Insured Persons.

There are still 836 persons not indexed since April, 1918, but it is worth noticing that since January, 1920, when a new method of notification was introduced, 845 new patients have been accepted. This would suggest that the total number of persons who have to choose a new doctor in any one year, as compared with the number who might be automatically transferred by change of practitioner, must be relatively large. Those figures could be easily obtained by the Ministry, and would be interesting in view of the injury that the new regulations must sometimes inflict on young men with limited capital seeking to enter general practice.

TABLE I.

Removals from List (304).

Ceased insurance	167*
Left area	81
Transferred by patient's request	33
Transferred at my request chiefly owing to distance ..	23

* 53 have since attended as private patients.

Analysis of Cases Desiring Transfer (33).

Cause not assignable	9
Chronic illness and unable to give relief	5
New address and distance from surgery probable ..	5
Refusal to commit breaches of certification rules ..	3
Opinion resented but still attending rest of family ..	3
Dissatisfied with treatment of private patient—one family	2
Refused to assist admission to local infirmary, one already discharged incurable, the other infectious	2
Pregnancy, and refusal to induce abortion..	1
Four transferences within three years, twice to me ..	1
Objection to locum tenens	1
Transferred by Insurance Committee on charge of negligence	1

Discontent.

Of the 2000 patients, 304 have been removed from this panel. The various causes for the removals have been analysed partly from the notification slips from the Insurance Committee, and partly from notes on the record sheets, and are tabulated (Table I.).

The number of apparently dissatisfied patients appears trifling, even including the nine* for whom no cause can be assigned, but the number is quite large enough in any area to give the impression of a large amount of discontent. It is surprising to observe over what a wide area one individual can noise his grievance. It does not appear to do any real harm. The average working-man has a great deal of sound logic in his make-up and it is very rarely that he allows his opinion of his medical adviser to be biased by the assertions of others. As individuals we ignore it, and perusal of the list will make it obvious that in certain cases one dare not tell the truth even if so disposed. It is doubtful if panel representatives are wise in giving it more than the most casual of notice.

Freedom of Transfer.

Insured persons have always been at liberty to transfer at any moment desired, without questions being asked. Only once has this rule been broken, and that was owing to insolence backed by threats anent certification. The patient was transferred at my request at the first opportunity. Ill-considered resolutions of panel representatives may ultimately rob the average practitioner of opportunities to display any of the time-honoured professional courtesies.

Record Cards of the Ministry.

When the new record cards of the Ministry were introduced their utility was considered, but so far as personal use is concerned they were discarded for the following reasons: (*a*) The space for observations is too small. (*b*) As they are sometimes transferred locally one has to exercise great discretion as to what one commits to paper. They are not privileged, neither is there any penalty for the divulgence of the remarks on them to the patient. (*c*) Records should still be of value even after the death of the individual, and the records of the Ministry are lost to the practitioner. (*d*) The observations of others are of doubtful value, as they may prejudice unfairly one's views of a patient's symptoms.

Certification.

Certification as a cause of needless friction and interference with medical benefit cannot be fully discussed here. Much has been made of the overcrowding of surgeries, and the following figures are worthy of consideration. The average daily number of patients attending surgery while incapacitated was taken over a period of five weeks. The consecutive figures for an average week were, 4·8; 2; 5; 1; 13·8; 2·6. Subordinate officials are not responsible for this state of affairs, neither can practitioners avoid it. Approved societies and the Ministry must share the responsibility between them. It is not purely a local phenomenon. The whole question of certification should be brought under review by the General Medical Council before support is lent to the complaint of Government departments in regard to the laxity of certification. It is surely possible to devise some form of certificate the signing of which would be compatible with self-respect.

Disability.

To analyse the value of the work Table III. has been drawn up to demonstrate (1) the nature of the disability; (2) operative interference; (3) permanent disablement; (4) death. An analysis of the causes of death in the various age-groups is given in Table II. The causes operating to produce disabilities have received much consideration especially in regard to "responsibility," whether it rests with the individual or to some factors quite beyond his control. In the study of preventive measures it is impossible to ignore this. As one's experience grows so does the impression grow that the accidental has as little relationship to the development of disease as the miraculous has to its cure.

TABLE II.

Analysis of causes of death in age-groups.	Age.						Total.
	16–25.	26–35.	36–45.	46–55.	56–65.	66 +	
Old age (over 70)	—	—	—	—	—	10	10
Malignant disease	—	—	1	4	3	1	9
Heart, diseases of	—	—	1	1	2	4	8
Phthisis	2	—	2	1	2	—	7
Pneumonia	—	2	—	1	3	—	6
Vascular lesion	1	—	—	1	2	1	5
General arterial degeneration ..	—	—	—	—	3	2	5
Kidney, diseases of..	1	1*	—	—	1	—	3
Unknown	—	—	—	1	—	1	2
Dementia	—	—	—	1	—	—	1
Parotid abscess	—	—	—	1†	—	—	1
Cellulitis and malignant endocarditis	—	—	—	—	1	—	1
Insular sclerosis	—	1	—	—	—	—	1
Tetanus	—	—	—	1*	—	—	1
Huntingdon's chorea	—	—	—	1‡	—	—	1
Total	4	4	4	13	17	19	61

* Died in hospital. † Certified by deputy.
‡ Post-mortem obtained.

In addition, 10 died of influenza during the epidemic, 1918–19. (Vide Brit. Med. Jour., 1919, ii., 519.)

For the purposes of this paper the disabilities have been divided into various types, more or less arbitrary; they suggest that the inter-relationship of those types and the relationship to the history of disease would form an interesting study. Unfortunately, its study is surrounded with many difficulties; a method to overcome some of these difficulties has been devised, but has not been in operation sufficiently long to prove its worth.

TABLE III.

Analysis of disabilities.	Total.	Operations.	Permanent disablement.	Deaths.
Respiratory	805 +	—	—	10*
Alimentary	519 +	25	—	—
Superficial integuments	284 +	4	—	—
Pain without associated symptoms ..	179 +	—	—	—
Ear, throat, and nose	171 +	8	—	—
Diseases of women	100 +	6	—	—
Muscles, bones, and their attachments ..	85 +	4	3	—
Circulatory	81 +	—	7	13
Subjective symptoms only	58 +	—	—	—
Disabilities due to war	42	—	2	2
Diseases of heart	37	—	2	8
Eye	34 +	2	1	—
Pneumonia	31	—	—	6
Neurosis, including epilepsy	29 +	—	1	—
Polyarthritis	20	—	—	—
Syphilis	19	—	1	—
Phthisis	18	—	3	7
Tuberculosis other than phthisis	16	5	2	—
Gonorrhœa	15	—	—	—
Genito-urinary, men	14	3	—	—
Chlorosis	13	—	—	—
Pleura	11	1	—	—
Malignant disease	10	2	—	9
Exophthalmic goitre..	4	—	1	—
Lunacy	4	—	—	1
Scarlet fever and measles	3	—	—	—
Insular sclerosis..	2	—	1	1
Glycosuria	2	—	—	—
Aneurysm	1	—	—	—
Chorea	1	—	—	—
Rodent ulcer	1	1	—	—
Tetanus	1	—	—	1
Huntingdon's chorea	1	—	—	1

* All influenzal.

It is necessary to explain that where a similar illness has occurred in a patient, irrespective of the interval between the attacks, it has been given one value. Violence has not been included. The respiratory type is abnormally inflated owing to the epidemic of influenza which occurred during the period under review. The number was not definitely ascertained; a rough estimate places it over 400.

Glycosuria.—These do not include some cases of very transient glycosuria. Routine analysis of urine is carried out and Fehling tested to excess. Of the two, one is known to have had the condition for over ten years and the other two years. Both can be controlled by diet.

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* The number was originally 11, but since commencing this paper, in two cases favourable opportunities have arisen for inquiry, and in both cases, marriage and removal from this neighbourhood was found to be the explanation.

Operations.—From a popular point of view the most satisfactory feature of the work has been the operative. I have the greatest pleasure in recording this fact, as none of the operations have been carried out personally. Of the 25 alimentary cases, 20 have been for appendicitis with 100 per cent. recovery. All showed evidence of inflammatory trouble. The small number of operations for malignancy is surprising. In one or two cases operation might have been possible if diagnosis could have been made earlier, but in two cases where the condition was very early suspected, the suggestion of laparotomy made them go elsewhere. One, a prominent society official, died under the care of a colleague, and the other again called me in consultation four days preceding death.

Additional Advice.—A considerable number have had the advantage of the opinion of consulting physicians or surgeons, and a large number have on occasion sought the advice of colleagues. Not a few have returned to ask me what I thought about it. One man whose only complaint was pain in the great toe and who died from a sarcoma of the pelvis, consulted "nine doctors and four herbalists" and called to give me the opinion of each. As to the more extensive utilisation of specialists, I have found no difficulty in obtaining their opinions as the need arose—through charitable institutions, or through private consultation where the patient could obviously afford it. Too easy access might tend to lower rather than raise the standard of work, and could easily be carried to absurdity.

Improvement of the Service.—Perhaps the ideal system of treatment would be large individual units where a practitioner could be in the financial position to pay for specialised assistants. For obvious reasons this is not a course likely to be favoured by the Government or approved societies. Their desire to increase the number of practitioners in an area and diminish their individual financial resources is sound tactics, and as politics go, one can overlook the assertion that it has anything to do with the question of efficiency or the advancement of medical science. It is more likely to retard it, so that as an alternative the following suggestions are made.

Diagnostic Centres.

Some method should be devised to bring the work of the consulting room into as close a relationship with physiological and biochemical laboratories as exists at the present time between the wards of a general hospital and the pathological department. It is doubtful whether when we fail to attach a name to a particular disability we are dealing with some unnamed disease. It is more probable that we are really dealing with those processes in a history of illnesses which is usually slurred over as ætiology. It is true that under the present method of certification we have to attach a name to those processes, and one can agree with Rowand of St. Andrews, that to do so is demoralising. We can gather the symptomatology of those cases, but the explanation will, I think, in many cases, be found in the laboratory.

While some of us may feel that we are doing better work by spending some portion of each day in the laboratory rather than running up an indefinite number of visits and consultations, we can never hope to be as proficient as the specialised laboratory worker. On the other hand, it must be rare to find a laboratory worker as skilled in the elicitation of symptoms as a skilled practitioner. There is, therefore, a great need for coöperation between the two. One would suggest that diagnostic centres should be opened up where a patient could be admitted for a few days and during that time remain in touch with his practitioner. This would get rid of the odium attached to the suggestion that one was too lazy to diagnose one's own cases. One cannot see the work going on in clinical laboratories without appreciating how much it is required. Its value has still to be proved, and even if proved, it may mean a new race of practitioners before it will come into its own. But a beginning could surely be made on a small scale as an adjunct to teaching centres.

A Department for Medical Research.

Under the Act there has been established a council for medical research, but the suggestion put forward is for the establishment of a department directly interested in the research work carried out in general practice. It may be urged that the amount of such work is now small. That may be true, but it certainly lacks both assistance and encouragement. It is not good that the ambitious young student should feel that by entering insurance practice he is entering an inferior service with a dead end, and a council of men of mature experience and wide sympathies is much required to assist young graduates during those years when the desire for research is strongest. "Much," said Dr. Johnson, "may be made of a Scotchman, if he be caught young," and the same might apply to the general practitioner. The department could become a great reservoir of knowledge, giving advice when asked, and supplying information when desired.

Much that requires investigation will mean research and observation over a life-time, and unfinished work, without such a department, is likely to be lost. While such work might prove of value to those who follow after, yet it might not be considered worthy of publication in the limited space of medical journals. Even that which has been on wrong lines might save some future worker from a similar error. All this must be voluntary, but the resources of the department should be open to anyone wishing to utilise them. The names should not be known to any local committee. The compulsory keeping of records might be abolished; the value of such records must be very slight, and the labour and finance saved might be applied to the purposes of this department.

Halifax.

THE CAUSE OF DEATH IN INTESTINAL OBSTRUCTION.[*]

By SETON PRINGLE, F.R.C.S. Irel.,
SURGEON TO THE ROYAL CITY OF DUBLIN HOSPITAL.

The cause of death in intestinal obstruction is still a subject for debate, and is a problem which has been constantly before my mind during the past 20 years, each year calling out with greater urgency for solution. Three theories have been advanced: (1) Infection—i.e., escape of organisms through the wall of the obstructed intestine, causing peritonitis; (2) absorption of toxins from the obstructed intestine; (3) depletion of systemic circulation and cerebral anæmia. I have frequently asked myself whether one of these three was the correct explanation, or whether each contained part of the truth?

Toxæmia the Most Constant Factor.

As experience increased with years, I found that the infective theory would only account for a very small proportion of the deaths, most cases dying long before there was marked peritonitis, and I gradually came to look on toxæmia as being the most constant—and probably the causal—factor, but many points still remained at issue. For instance, I found it impossible to reconcile with the toxæmic theory the fact of the sometimes rapid death in strangulation where, presumably, the absorption from the strangulated loop cannot be great on account of the obstructed venous return. Can the toxæmia in these cases arise from absorption from the intestine above the strangulated loop—intestine which was in a condition of simple obstruction? Does the factor of shock and reflex dilatation of the portal system occur in these strangulation cases, thus accounting for the greater rapidity of death? Again, is death in peritonitis due to septic absorption, or is it not often chiefly due to the absorption of toxins from the paralysed and distended gut? In the absence of time and facilities for experimental work, I recently turned to the very extensive literature on the subject, and I think a résumé of the results may perhaps interest other surgeons.

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[*] Read before the Surgical Section of the Royal Academy of Medicine in Ireland on March 9th, 1923.

I found that a tremendous amount of work had been done, chiefly in America and on the Continent, and that, as a result of all this work, two facts stand out clearly and confirm our clinical experience: (1) Peritonitis is not the chief factor in causing death, which often occurs before its onset and almost always before it is extensive; (2) the higher up the obstruction, the more rapidly is it fatal. For example:

Dogs[1]	obstructed in the rectum live..	28 days.
,,	,, ,, ileo-cæcal valve live	14 ,,
,,	,, 35 cm. below pylorus live	7 ,,
,,	,, 2nd stage duodenum live .	2 ,,
Rabbits[1]	obstructed in colon live	10 ,,
,,	,, in lower ileum live ..	4–5 ,,
,,	,, at end of duodenum live	17 hours.

As regards the other results obtained, the weight of evidence is all in favour of death being due to a toxæmia resulting from absorption of a toxin, or toxins, from the obstructed intestine, and the efforts of most workers have been directed towards discovering the site of production, the nature and the source of the toxin.

Site of Production of the Toxin.

The fact being established that the higher up in the small intestine the obstruction occurs, the more rapid is death, the attention of most observers was focused on the duodenum. It has been shown that if the second stage of the duodenum be obstructed,[3] or if a loop of the duodenum be isolated, closed at both ends and its blood-supply left intact,[4] death occurs in a very few days with the symptoms of toxæmia—i.e., dullness and apathy, tachycardia, muscular weakness and tremors, renal suppression, vomiting, temperature disturbances, and fall of blood pressure; whereas a similar isolation of a loop of ileum is compatible with life for many weeks, death occurring not from toxæmia, but from rupture of the loop and peritonitis.[5 6] If, however, the loop above the obstruction be drained externally or into the intestine,[3 7] or if the loop be kept washed out, the animal survives for a much longer period.[8] Again, if the contents of an isolated duodenal loop be heated to 60° C. for an hour, filtered, and then injected either intravenously or intraperitoneally, rapid death with the same symptoms ensues,[4] and, moreover, dogs can be immunised against this toxin by the injection of gradually increasing doses.[9] Again, if the duodenum with the bile and pancreatic ducts be transplanted so that it drains into the ileum, and then some weeks later the jejunum be obstructed high up, dogs will survive for more than twice as long as dogs in which the duodenum has not been transplanted before obstruction is produced.[1]

These results go to prove that the duodenum and its appendages, the liver and *pancreas, not* only produce the toxin which causes death with symptoms similar to those of intestinal obstruction, but produce it in far greater quantities than any other part of the intestine.

Nature of the Toxin.

The nature of the toxin has not been definitely settled. It is, however, generally accepted that it belongs to *one* of the groups of poisonous chemical substances produced by the disintegration of protein—e.g., proteoses, amines, neurines, and cholines. Several groups of observers have been able to isolate a proteose in an almost chemically pure state from the contents of obstructed duodenal loops.[10 4 9 1] An injection of this proteose produced rapid death with the train of toxic symptoms already enumerated. The probability, however, seems to be that a whole series of the end-products of protein are present in the obstructed intestine, and are active in producing death.[11]

Source of the Toxin.

In considering the possible source of the toxin three different possibilities have to be considered: (1) food; (2) duodenal secretion, either alone or with the bile and pancreatic juice; and (3) products of bacterial action on the intestinal content. Before discussion of the points for and against each of these possible sources, it may be stated that experimental work has so far failed to demonstrate clearly the origin of the toxin. It is generally accepted that it is not derived from the protein of the food, for it has developed both in a loop above a simple duodenal obstruction produced in dogs that have fasted for many hours,[3] and in an isolated duodenal loop which has been carefully washed out before being closed off.[4] As against bacterial origin for the toxin, many points can be urged—e.g., the higher up the obstruction, the more rapid is death, yet the less is the bacterial content. And, again, the isolation of a duodenal loop which contains few, if any, bacteria, is rapidly fatal, whereas the isolation of a loop of ileum, or even of colon,[12] with their numerous organisms, is not incompatible with life for a long period. Many workers, however, [13 14 15 16] cling to the bacterial origin of the toxin, and advance many arguments in its favour—e.g., it has been shown that the fresh secretion of the normal duodenum from which food is excluded is non-toxic, and remains non-toxic if kept under conditions which inhibit bacterial growth, but if it is incubated with its own bacterial content, a toxin rapidly develops, injection of which causes symptoms like those following the injection of the fluid from obstructed loops.[11]

Others—especially Draper, who has operated on many hundreds of dogs—maintain that the toxic substance is a normal secretion of the duodenum and its appendages, the liver and pancreas; that normally it is detoxicated or neutralised by the jejunal and ileal mucosa lower down, but that in obstruction this is prevented, and that, instead, it is retained in the duodenum, is absorbed, and produces the typical toxæmia. In confirmation of this he showed that when dogs with duodenal obstruction are fed with the mucosa of jejunum or ileum from normal dogs, the obstructed animal survived for twice as long.[17] Others have demonstrated that the toxic contents of obstructed loops which cause rapid death on intravenous or intraperitoneal injection, produce no deleterious effects on injection into the intestine of normal dogs.[18] He therefore believes the toxin to be biochemical in nature, similar to prosecretin.

Subsidiary Factors.

In discussing the nature of the toxin it is of interest to note the close resemblance between the symptoms of acute pancreatitis and those of high intestinal obstruction, especially as it has been shown by the following experiment that the presence of pancreatic secretion in the duodenum is necessary for the production of the toxin. (1) If the duct of the pancreas be tied, and then some weeks later high duodenal obstruction be produced, the dog will live about twice as long as when the pancreatic secretion is reaching the duodenum, and that under these conditions a choline—not a proteose—is found in the loop.[7] (2) Obstruction immediately above the pancreatic duct is much less rapidly fatal than obstruction immediately below.[6] As regards the rôle of the bile, Draper showed that the rapidity of death from duodenal obstruction was *not* influenced by the presence or absence of bile.[8]

While, as already stated, the toxæmic theory of death is generally accepted, yet there are not wanting those [22 2 19] who hold the third theory I mentioned—namely, depletion of the systemic circulation, dehydration of the tissues, and cerebral anæmia brought about by (*a*) shock, producing reflex paresis of the splanchnic area with engorgement of the portal system; (*b*) hypersecretion of fluid into the intestine, and (*c*) vomiting. These three phenomena certainly occur, but I think that the first—i.e., shock—is the only one which is a real though variable factor in the production of death, and that the other two are a direct result of the presence of poisonous substances in the intestinal tract and circulation. The supporters of the theory point to the markedly beneficial result of the introduction into the systemic circulation of large quantities of saline, but, taking all the available facts into consideration, I believe this beneficial result can be better explained by considering that the saline acts, chiefly at least, by diluting the toxin in the circulating blood. It has been shown[17] experimentally that injection of pilocarpine for four days, fasting for seven days, or duodenal obstruction for three days, each produces a relatively equal reduction of the quantity of water in the tissues, and yet no serious toxæmic symptoms follow either the pilocarpine injection or the fasting, whereas duodenal obstruction causes death as described above in three days. The only experimental work done on this subject in the British Isles of which I can find a record is that of Wilkie, of Edinburgh.[2] He concludes that the chief factor in producing death is dehydration of the tissues, and he bases this conclusion on the fact that, working chiefly on cats, he was unable to produce death by injecting the contents of obstructed loops into other cats. Another observer[20] has, however, found that although cats develop in obstructed loops toxic bodies similar or identical with those already described, yet they seem to be immune to injection of these bodies, though injection of the same toxic bodies obtained from cats is rapidly fatal to dogs with characteristic symptoms.

Conclusions.

I think we are justified in drawing the following conclusions from all this experimental work:—

(1) The principal factor in causing death in intestinal obstruction is a toxin which is developed chiefly in duodenum, and, although not absorbed from normal intestine, is absorbed under the conditions which prevail in obstruction.

(2) The exact chemical composition of the toxin is still under dispute, but it is almost certainly of the nature of one or other of the toxic bodies derived from protein disintegration.

(3) The exact mode of production of the toxin is also undecided, but probably the presence of pancreatic secretion, and, in a lesser degree, the activities of bacteria are necessary for its production.

(4) While the duodenum is the site of maximum toxicity in obstruction, yet the poisonous substances are developed lower down in the intestine, and it is probable that in the production of these toxins bacterial action plays an important rôle—a rôle which increases in importance the lower down the obstruction occurs.

The value of all this work and the conclusions drawn from it must finally be decided by clinical results. Do the above conclusions hold true if examined in the light of clinical experience? I believe that, for the most part, they do. In the first place, the great majority of surgeons, as the result of clinical experience and quite apart from any experimental work, are agreed that toxæmia is the chief cause of death in intestinal obstruction. Again, all are agreed as to the great benefit of large saline infusions in obstruction cases—a benefit which can be better explained by the toxæmic than by the systemic dehydration theory. Still more strongly in favour of the toxæmia theory is the fact that stomach lavage, useful as it is in all obstruction cases, is most useful in acute dilatation of the stomach. Post mortem, in most fatal cases of this condition, the duodenum is also distended, so that the functional obstruction, whatever its cause, almost exactly reproduces the conditions of many of the experiments on which the toxæmic theory is based, and the benefit of lavage may therefore be explained by the removal of the toxins generated. The same remarks apply to the well-known good results following lavage in those cases, sometimes following gastroenterostomy, where there appears to be a temporary obstruction (probably functional and due to trauma at the operation) to the on-flow of the gastric and duodenal contents.

However, although I believe that toxæmia is generally the chief factor in causing death, yet I think it is rarely—if ever—the only factor. Nor does this theory explain the phenomena of many obstruction cases, for instance, in the cases of rapid death, which sometimes follow acute strangulation, the toxæmia can only be of minor importance. In strangulation we have two distinct conditions: a closed loop from which the circulation is cut off, and, above that, a part of the intestine in a condition of simple obstruction. Toxins, if formed in the closed strangulated loop, cannot be freely absorbed, while death occurs in some of these cases long before there is time for any great amount of toxin to be developed in the simply obstructed intestine above the strangulated portion. Such deaths must be due to shock. Again, it has been a common experience of mine to find on closely questioning the patients in ordinary cases of strangulated hernia that he or she vomited coincidently with the onset of pain, and then perhaps six or eight hours elapsed before any more vomiting occurred. I believe the early vomiting to be due to the temporary shock, and the later to toxæmia. For these clinical reasons, therefore, I think that shock is a more important factor in causing death than the experimental work leads one to believe, and that in some cases of strangulation it is the chief factor, producing, among other conditions, an engorgement of the portal system.

Finally, I would like to suggest that intestinal toxæmia has a large share in causing death in acute septic peritonitis. I have long believed that the fatal result is not due in most of these cases to the absorption of the products of the suppurative inflammation of the peritoneum—the symptoms preceding death are generally those of intestinal obstruction, not sepsis. To my mind, there are three factors at work in acute peritonitis: (1) shock, (2) septic absorption from the peritoneum, and (3) toxæmia from the intestine, the involved part of which is generally in a condition of paresis, producing obstruction. These three factors must be constantly increasing as the inflammation spreads. I would argue that, if the shock and toxæmia be combated, there is a possibility of prolonging the patient's life sufficiently to give the wonderful fighting powers of the peritoneum a chance of dealing with the infection. I believe that I have saved what appeared to be quite hopeless cases by not only using morphia and saline-glucose infusions to combat the shock and toxæmia, but also by directly attacking the source of the toxin by means of an enterostomy high up in the small intestine. The operation I have performed is after the manner of a Witzel's gastrostomy—a No. 12 soft rubber catheter is inserted into the lumen of the intestine through a small puncture and fixed in position by a single catgut stitch, the next couple of inches are buried in the intestinal wall by a continuous in-folding stitch, and the proximal end is passed through a hole in the omentum, as described by Mayo,[21] before being brought out through the abdominal wall. To the end of the catheter a long tube is attached to drain into a bottle beside the bed. An enterostomy after this fashion allows free escape of the toxic intestinal contents, and, at the same time, permits the introduction of saline and glucose. When the necessity for drainage is over the tube can be removed, and as the opening into the intestine is valvular and the "sealing-off" properties of the omentum have been utilised, little or no escape of intestinal contents occurs, and all excoriation of the skin is avoided.

The results I have obtained by this method are most encouraging, and I am convinced that its use in selected cases is well worth further trial, especially as it is founded on what appears to be a sound experimental basis.

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(*Continued at foot of next column.*)

A CASE OF
INSPIRATORY APNŒA IN A NEW-BORN INFANT.

BY W. DOUGLAS KIRKWOOD, M.D. EDIN.,
AND
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(*With Pathological Report by*
THOMAS W. LUMSDEN, M.D. Aberd.)

WE desire to record the case of a new-born infant in which there were unusual respiratory symptoms, and, as the pathological appearances in this instance were apparently similar to results obtained by Lumsden in experiments on the cat in connexion with the respiratory centres, we deemed it advisable to report the clinical symptoms and the pathological findings of this case in full for the purpose of a comparison.

The Case Described.

Birth.—The mother, aged 25, was delivered of her first child (a male) on March 18th of this year. The infant was two weeks premature. There was nothing of special interest in connexion with the birth, the labour occupying about 12 hours, but with only two to three hours' real pains; the child was born without any interference of any kind and was found to be normal in every way when examined after birth. The head did not show the slightest sign of injury. Although breathing became established immediately after birth the infant looked distinctly cyanosed for a time.

First Attack of Apnœa.—The child appeared to be normal in every way on the first day; it was rather restless on the second night after birth, and on the third day did not appear to be quite well, although so far certainly not definitely ill. About 11 A.M. it was noticed to have a sudden cessation of breathing for a short period with cyanosis, followed by resumption of normal breathing. Artificial respiration was resorted to. Several such attacks occurred at intervals.

Examination: Further Attacks.—When the child was seen by one of us (B. M.) within two hours of the first attack it appeared to be in every way a very fine specimen of a baby. On examination a little rigidity of the right arm and leg was discovered. Shortly afterwards a few *twitchings* were noticed in the right hand (within half an hour the same thing was observed in the left hand). The breathing at this time was perfectly normal. The child had passed meconium several times, which macroscopically showed no abnormality, and no blood was visible. The little patient *had* been fed by breast and had also been given Glaxo. Quite suddenly, the infant took a little deeper inspiration than usual and then ceased breathing. Cyanosis soon appeared which gradually became more marked. After about 20 seconds there were two or three short irregular respirations, after which normal breathing became re-established and the cyanosis passed off. During this period there were no convulsions or twitchings. The examination of the patient was then continued. There was no sign of congenital heart disease, nor atelectasis; the air entry into the lung was free and expansion good over all parts of the chest. Nothing of clinical importance was found in the abdomen, pharynx, nose, or neck. There was a very slight yellow tint on the skin, but practically no more than ordinary icterus neonatorum. There were no petechiæ. No increased pressure was felt at the *anterior* fontanelle. Signs of injury, hæmatoma, meningocele, or any other abnormality were absent. The temperature was normal. No ear discharge was apparent. Urine was freely passed, and the child had passed two motions in the 24 hours.

Within 15 or 20 minutes another attack was witnessed, much similar to the last, with the exception that the attack lasted for about 40 seconds, when breathing was again re-established. During this *attack* the eyes seemed to slightly point to the right and upwards for a few seconds. The tongue was normal and nothing unusual was seen in the face or position of head.

As the examination of the lungs, trachea, pharynx, and circulatory system elicited nothing to explain the condition, and Buhl's disease being in no way suggested, the symptoms seemed to be due to damage to the brain, most likely of a hæmorrhagic nature in which the respiratory centre was specially affected. The symptoms also suggested that the cortical or subcortical tissues of the left side of the brain were likewise implicated to some extent.

In the event of further attacks the nurse was instructed to perform artificial respiration, give oxygen, and sprinkle cold water on the chest. Tincture of belladonna was prescribed as a stimulant to the respiratory centre. Eight drops of brandy in a teaspoonful of water were to be given between attacks if required.

The infant seemed better for two hours, but then attacks of apnœa appeared again, the respiration ceasing in the inspiratory position for varying periods, with the appearance, as before, of cyanosis, and its disappearance after respiration had become re-established. If apnœa terminated spontaneously, it was broken by two or three short inspiratory gasps; these were succeeded by a further period of apnœa or by normal breathing. There were occasions when the baby slept for as long as one and a half hours at a time, breathing normally and appearing to be quite well. It would then wake up and have twitchings or a mild convulsion which were more marked on the right side. On one occasion, when the baby was lying on its right side, a convulsion began with a movement upwards of the eyes; at the same time the head was lifted from the pillow. When the *attacks* were over the child seemed exhausted but breathed normally. No definite sequence could be made out between the apnœa and the convulsions, as sometimes the one occurred without the other, while at other times they coincided. Each seemed independent of the *other*. *Later* on in the day the convulsions became more generalised and were heralded with a small "meningeal cry."

Death.—When artificial respiration was performed for the apnœa the latter was always cut short and normal breathing quickly re-established. *Between* the attacks the baby still looked normal. About 8 o'clock on the same day (that is, the third day after birth) the child, *having* just had a good quiet sleep, became apnœic, but resumed normal breathing with the assistance of a little squeezing. It was apparently lying quietly, its appearance for the moment giving no immediate cause for alarm, when it gave one deep inspiratory gasp and died.

It may be stated that no drugs had been given to the mother either immediately before or during labour, but *a* few whiffs of chloroform (insufficient to remove consciousness) were administered just before the birth.

An Experimental Parallel.

There have recently appeared some most interesting and cogent observations by Lumsden, who has investigated the respiratory centres in the cat, and his results seem to help materially in the elucidation of this case. In order to make the matter clear we are inserting, by kind permission of the editor of the *Journal of Physiology*,[1] two of his diagrams.* He states:—

"The theory generally held is that the automatic respiratory centre is in the lower part of the bulb, and that the regulation of impulses sent *out by it* is determined by impulses passing to it."

The following are his conclusions:—

1. "In the cat the central respiratory mechanism consists of: (*a*) A part below the striæ acusticæ which when working alone causes gasping respirations. The nerve cells producing this effect may be spoken of as the gasping centre. (*b*) A part at the level of the *striæ acusticæ* which sends out impulses causing a series of prolonged inspirations. The prolonged inspirations may be called *apneuses* and the *nerve* cells producing them the apneustic centre. (Apneusis indicating a holding of the breath in the inspiratory position.) (*c*) A part in the upper pons region which periodically inhibits the activity of the apneustic centre and so produces normal respiration. The nerve cells having this effect *may* be called the pneumotaxic centre.

2. The posterior corpora quadrigemina have in the cat no appreciable influence on respiration.

(Continued from preceding column.)
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* Draper Maury subsequently changed his name to Draper.

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large quantities of saline, but, taking all the available facts into consideration, I believe this beneficial result can be better explained by considering that the saline acts, chiefly at least, by diluting the toxin in the circulating blood. It has been shown[17] experimentally that injection of pilocarpine for four days, fasting for seven days, or duodenal obstruction for three days, each produces a relatively equal reduction of the quantity of water in the tissues, and yet no serious toxæmic symptoms follow either the pilocarpine injection or the fasting, whereas duodenal obstruction causes death as described above in three days. The only experimental work done on this subject in the British Isles of which I can find a record is that of Wilkie, of Edinburgh.[2] He concludes that the chief factor in producing death is dehydration of the tissues, and he bases this conclusion on the fact that, working chiefly on cats, he was unable to produce death by injecting the contents of obstructed loops into other cats. Another observer[20] has, however, found that although cats develop in obstructed loops toxic bodies similar or identical with those already described, yet they seem to be immune to injection of these bodies, though injection of the same toxic bodies obtained from cats is rapidly fatal to dogs with characteristic symptoms.

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(4) While the duodenum is the site of maximum toxicity in obstruction, yet the poisonous substances are developed lower down in the intestine, and it is probable that in the production of these toxins bacterial action plays an important rôle—a rôle which increases in importance the lower down the obstruction occurs.

The value of all this work and the conclusions drawn from it must finally be decided by clinical results. Do the above conclusions hold true if examined in the light of clinical experience? I believe that, for the most part, they do. In the first place, the great majority of surgeons, as the result of clinical experience and quite apart from any experimental work, are agreed that toxæmia is the chief cause of death in intestinal obstruction. Again, all are agreed as to the great benefit of large saline infusions in obstruction cases—a benefit which can be better explained by the toxæmic than by the systemic dehydration theory. Still more strongly in favour of the toxæmia theory is the fact that stomach lavage, useful as it is in all obstruction cases, is most useful in acute dilatation of the stomach. Post mortem, in most fatal cases of this condition, the duodenum is also distended, so that the functional obstruction, whatever its cause, almost exactly reproduces the conditions of many of the experiments on which the toxæmic theory is based, and the benefit of lavage may therefore be explained by the removal of the toxins generated. The same remarks apply to the well-known good results following lavage in those cases, sometimes following gastro-enterostomy, where there appears to be a temporary obstruction (probably functional and due to trauma at the operation) to the on-flow of the gastric and duodenal contents.

However, although I believe that *toxæmia* is generally the chief factor in causing death, yet I think it is rarely—if ever—the only factor. Nor does this theory explain the phenomena of many obstruction cases, for instance, in the cases of rapid death, which sometimes follow acute strangulation, the toxæmia can only be of minor importance. In strangulation we have two distinct conditions: a closed loop from which the circulation is cut off, and, above that, a part of the intestine in a condition of simple obstruction. Toxins, if formed in the closed strangulated loop, cannot be freely absorbed, while death occurs in some of these cases long before there is time for any great amount of toxin to be developed in the simply obstructed intestine above the strangulated portion. Such deaths must be due to shock. Again, it has been a common experience of mine to find on closely questioning the patients in ordinary cases of strangulated hernia that he or she vomited coincidently with the onset of pain, and then perhaps six or eight hours elapsed before any more vomiting occurred. I believe the early vomiting to be due to the temporary shock, and the later to toxæmia. For these clinical reasons, therefore, I think that shock is a more important factor in causing death than the experimental work leads one to believe, and that in some cases of strangulation it is the chief factor, producing, among other conditions, an engorgement of the portal system.

Finally, I would like to suggest that intestinal toxæmia has a large share in causing death in acute septic peritonitis. I have long believed that the fatal result is not due in most of these cases to the absorption of the products of the suppurative inflammation of the peritoneum—the symptoms preceding death are generally those of intestinal obstruction, not sepsis. To my mind, there are three factors at work in acute peritonitis: (1) shock, (2) septic absorption from the peritoneum, and (3) toxæmia from the intestine, the involved part of which is generally in a condition of paresis, producing obstruction. These three factors must be constantly increasing as the inflammation spreads. I would argue that, if the shock and toxæmia be combated, there is a possibility of prolonging the patient's life sufficiently to give the wonderful fighting powers of the peritoneum a chance of dealing with the infection. I believe that I have saved what appeared to be quite hopeless cases by not only using morphia and saline-glucose infusions to combat the shock and toxæmia, but also by directly attacking the source of the toxin by means of an enterostomy high up in the small intestine. The operation I have performed is after the manner of a Witzel's gastrostomy—a No. 12 soft rubber catheter is inserted into the lumen of the intestine through a small puncture and fixed in position by a single catgut stitch, the next couple of inches are buried in the intestinal wall by a continuous in-folding stitch, and the proximal end is passed through a *hole in the omentum*, as described by Mayo,[21] before being brought out through the abdominal wall. To the end of the catheter a long tube is attached to drain into a bottle beside the bed. An enterostomy after this fashion allows free escape of the toxic intestinal contents, and, at the same time, permits the introduction of saline and glucose. When the necessity for drainage is over the tube can be removed, and as the opening into the intestine is valvular and the "sealing-off" properties of the omentum have been utilised, little or no escape of intestinal contents occurs, and all excoriation of the skin is avoided.

The results I have obtained by this method are most encouraging, and I am convinced that its use in selected cases is well worth further trial, especially as it is founded on what appears to be a sound experimental basis.

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2. Wilkie: Brit. Med. Jour., 1913, ii., 1064.
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4. Stone, Bernheim, and Whipple: Ibid., 1914, lix., 714.
5. Halsted: Referred to by Sweet, Peet, and Hendrix, q.v.

(Continued at foot of next column.)

A CASE OF INSPIRATORY APNŒA IN A NEW-BORN INFANT.

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PHYSICIAN TO IN-PATIENTS AT ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN, ETC.
(*With Pathological Report by*
THOMAS W. LUMSDEN, M.D. Aberd.)

WE desire to record the case of a new-born infant in which there were unusual respiratory symptoms, and, as the pathological appearances in this instance were apparently similar to results obtained by Lumsden in experiments on the cat in connexion with the respiratory centres, we deemed it advisable to report the clinical symptoms and the pathological findings of this case in full for the purpose of a comparison.

The Case Described.

Birth.—The mother, aged 25, was delivered of her first child (a male) on March 18th of this year. The infant was two weeks premature. There was nothing of special interest in connexion with the birth, the labour occupying about 12 hours, but with only two to three hours' real pains; the child was born without any interference of any kind and was found to be normal in every way when examined after birth. The head did not show the slightest sign of injury. Although breathing became established immediately after birth the infant looked distinctly cyanosed for a time.

First Attack of Apnœa.—The child appeared to be normal in every way on the first day; it was rather restless on the second night after birth, and on the third day did not appear to be quite well, although so far certainly not definitely ill. About 11 A.M. it was noticed to have a sudden cessation of breathing for a short period with cyanosis, followed by resumption of normal breathing. Artificial respiration was resorted to. Several such attacks occurred at intervals.

Examination: Further Attacks.—When the child was seen by one of us (B. M.) within two hours of the first attack it appeared to be in every way a very fine specimen of a baby. On examination a little rigidity of the right arm and leg was discovered. Shortly afterwards a few twitchings were noticed in the right hand (within half an hour the same thing was observed in the left hand). The breathing at this time was perfectly normal. The child had passed meconium several times, which macroscopically showed no abnormality, and no blood was visible. The little patient had been fed by breast and had also been given Glaxo. Quite suddenly, the infant took a little deeper inspiration than usual and then ceased breathing. Cyanosis soon appeared which gradually became more marked. After about 20 seconds there were two or three short irregular respirations, after which normal breathing became re-established and the cyanosis passed off. During this period there were no convulsions or twitchings. The examination of the patient was then continued. There was no sign of congenital heart disease, nor atelectasis; the air entry into the lung was free and expansion good over all parts of the chest. Nothing of clinical importance was found in the abdomen, pharynx, nose, or neck. There was a very slight yellow tint on the skin, but practically no more than ordinary icterus neonatorum. There were no petechiæ. No increased pressure was felt at the anterior fontanelle. Signs of injury, hæmatoma, meningocele, or any other abnormality were absent. The temperature was normal. No ear discharge was apparent. Urine was freely passed, and the child had passed two motions in the 24 hours.

Within 15 or 20 minutes another attack was witnessed, much similar to the last, with the exception that the attack lasted for about 40 seconds, when breathing was again re-established. During this attack the eyes seemed to slightly point to the right and upwards for a few seconds. The tongue was normal and nothing unusual was seen in the face or position of head.

As the examination of the lungs, trachea, pharynx, and circulatory system elicited nothing to explain the condition, and Buhl's disease being in no way suggested, the symptoms seemed to be due to damage to the brain, most likely of a hæmorrhagic nature in which the respiratory centre was specially affected. The symptoms also suggested that the cortical or subcortical tissues of the left side of the brain were likewise implicated to some extent.

In the event of further attacks the nurse was instructed to perform artificial respiration, give oxygen, and sprinkle cold water on the chest. Tincture of belladonna was prescribed as a stimulant to the respiratory centre. Eight drops of brandy in a teaspoonful of water were to be given between attacks if required.

The infant seemed better for two hours, but then attacks of apnœa appeared again, the respiration ceasing in the inspiratory position for varying periods, with the appearance, as before, of cyanosis, and its disappearance after respiration had become re-established. If apnœa terminated spontaneously, it was broken by two or three short inspiratory gasps; these were succeeded by a further period of apnœa or by normal breathing. There were occasions when the baby slept for as long as one and a half hours at a time, breathing normally and appearing to be quite well. It would then wake up and have twitchings or a mild convulsion which were more marked on the right side. On one occasion, when the baby was lying on its right side, a convulsion began with a movement upwards of the eyes; at the same time the head was lifted from the pillow. When the attacks were over the child seemed exhausted but breathed normally. No definite sequence could be made out between the apnœa and the convulsions, as sometimes the one occurred without the other, while at other times they coincided. Each seemed independent of the other. Later on in the day the convulsions became more generalised and were heralded with a small "meningeal cry."

Death.—When artificial respiration was performed for the apnœa the latter was always cut short and normal breathing quickly re-established. Between the attacks the baby still looked normal. About 8 o'clock on the same day (that is, the third day after birth) the child, having just had a good quiet sleep, became apnœic, but resumed normal breathing with the assistance of a little squeezing. It was apparently lying quietly, its appearance for the moment giving no immediate cause for alarm, when it gave one deep inspiratory gasp and died.

It may be stated that no drugs had been given to the mother either immediately before or during labour, but a few whiffs of chloroform (insufficient to remove consciousness) were administered just before the birth.

An Experimental Parallel.

There have recently appeared some most interesting and cogent observations by Lumsden, who has investigated the respiratory centres in the cat, and his results seem to help materially in the elucidation of this case. In order to make the matter clear we are inserting, by kind permission of the editor of the *Journal of Physiology*,[1] two of his diagrams. He states:—

> "The theory generally held is that the automatic respiratory centre is in the lower part of the bulb, and that the regulation of impulses sent out by it is determined by impulses passing to it."

The following are his conclusions:—

1. "In the cat the central respiratory mechanism consists of: (*a*) A part below the striæ acousticæ which when working alone causes gasping respirations. The nerve cells producing this effect may be spoken of as the gasping centre. (*b*) A part at the level of the striæ acousticæ which sends out impulses causing a series of prolonged inspirations. The prolonged inspirations may be called apneuses and the nerve cells producing them the apneustic centre. (Apneusis indicating a holding of the breath in the inspiratory position.) (*c*) A part in the upper pons region which periodically inhibits the activity of the apneustic centre and so produces normal respiration. The nerve cells having this effect may be called the pneumotaxic centre.

2. The posterior corpora quadrigemina have in the cat no appreciable influence on respiration.

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[1] Observations on the Respiratory Centres in the Cat, by Thomas W. Lumsden, M.D. (from the Department of Pathology, Lister Institute), Journal of Physiology, vol. lvii., Nos. 3 and 4.

(*Continued from preceding column.*)

6. Bunting and Jones: Jour. Exp. Med., July, 1913.
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8. Draper Maury*: Amer. Jour. Med. Sc., May, 1909.
9. Whipple, Stone, and Bernheim: Jour. Exp. Med., 1914, xix., 144, 166. Whipple and Others: Ibid., 1916, xxiii., 123. Whipple and Cooke: Ibid., 1917, xxv., 461. McQuarie and Whipple: Ibid., 1919, xxix., 397.
10. Rogère: Presse Méd., 1911, Nov. 1st, 1.
11. Stone and Davis: Jour. Exp. Med., 1917, xxv.
12. Blake and Brown: Annals Surg., 1907, xlvi., 568.
13. Murphy and Vincent: Boston Med. Jour., Nov. 2nd, 1911.
14. Dagstedt and Others: Jour. Exp. Med., 1917, xxv., 421; 1918, xxvi., 359; 1919, xxx., 109.
15. Kukula: Arch. f. Klin. Chir., lxiii., 773.
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17. Draper*: Jour. Amer. Med. Assoc., September, 1914, lxiii., 1079.
18. Stone: Surg. Gyn. and Obs., May, 1921, 415.
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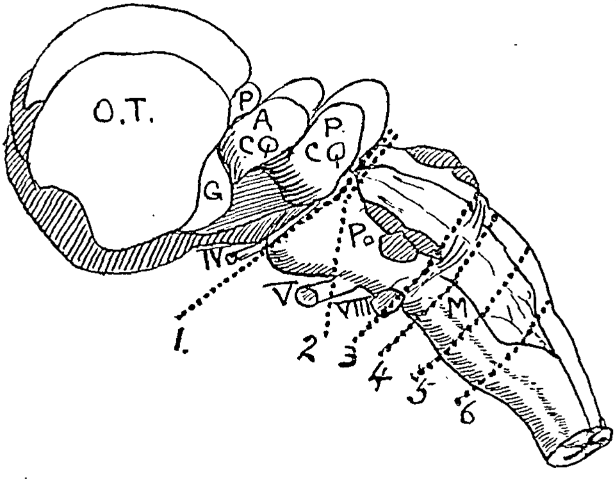
20. Davis: Johns Hopkins Bull., February, 1914.
21. Mayo, C. H.: Annals Surg., 1917, lxvi., 568.
* Draper Maury subsequently changed his name to Draper.

He states further:—

“*Section in the Upper Part of the Pons.*—A section along line 2, Fig. 1, or at any point between lines 2 and 3, causes instantaneously a full development of the inspiratory type of breathing, and this happens whether the fifth and tenth nerves have been cut or not; a slow deep inspiration is taken, and the inspiratory position is held for two or even three minutes. During the last part of the time the muscles relax slowly, and finally give way suddenly. Two or three relatively quick respirations of abnormal type are then taken. Following these there is again a prolonged inspiration and so on. The cycle repeats itself with great regularity for, it may be, two or three hours, but the duration of the inspirations gradually lessens. The blood-pressure tracing taken simultaneously (Fig. 3 in *Journal* but Fig. 2 here) shows that during prolonged inspiration the arterial pressure first rises and later sinks to a low level. It rises again rapidly during the short period of relatively quick respirations.” “Section between lines 5 and 6 causes the cessation of all respiratory movement and death.”

FIG. 1.—*Diagram of Brain-Stem showing Level of Crucial Sections (Cat).*



Level 1, just behind posterior corpora quadrigemina dorsally and above pons ventrally; 2, dorsally same at Level 1, ventrally at mid-pons; 3, just above striæ acousticæ; 4, just below striæ acousticæ; 5, half way between 4 and 6; 6, just above angle of calamus scriptorius. The pneumotoxic centre is placed between 1 and 2. Apneustic centre between 3 and 4. Gasping centre between 5 and 6.

Lumsden adds:—

“ . . . When an animal which has been so nearly dead as to cease breathing is revived by means of artificial respirations, the respiration returns in the reverse order (to the effect of asphyxia or anæsthetics on animal dying from same) a preliminary period of gasping is followed by a series of prolonged inspirations which gradually shorten until they become indistinguishable from slow natural breathing, and soon the normal respiratory rhythm is resumed.”

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It appeared to us that Lumsden's experiments on the brain-stem of the cat were likely to shed light as to the cause of death of this infant. It was most fortunate, therefore, that he was able personally to investigate the brain-stem of this case.

Report by Dr. T. W. LUMSDEN.—“No signs of purpura were visible. On opening the cranium, the vessels on the pia were found to be much dilated and there were a number of subpial punctiform hæmorrhages both on the convexity of the brain and on the walls of the lateral ventricles. The choroid plexuses were intensely injected. The minute hæmorrhages above-mentioned were entirely superficial and there was no escape of blood into the ventricles. There was nothing abnormal to the naked eye in the regions of the pons or medulla. On section of the brain the grey matter was pinker than usual, even in a new-born baby. The brain was carefully opened and placed in formalin for 48 hours, after which it was examined by slicing it and the brain-stem at intervals of about 1 cm., but nothing further abnormal was found.

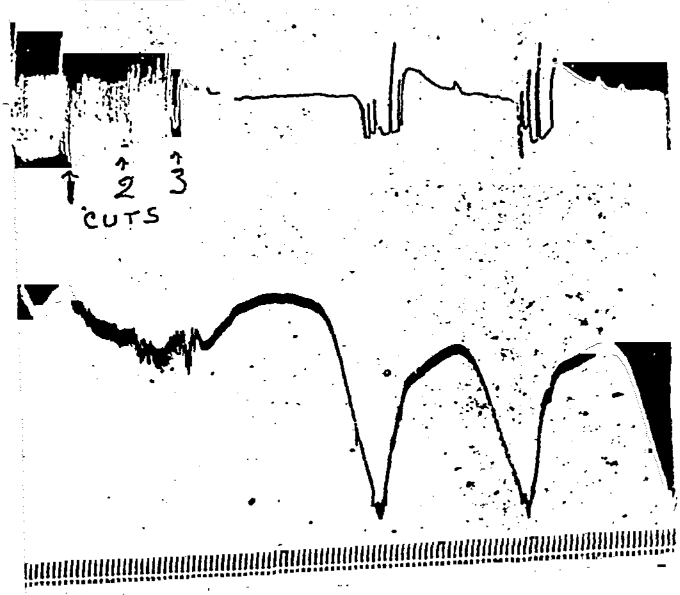
It may be well to state categorically that there was no evidence of meningitis or of gross hæmorrhages into the meninges, the ventricles, or the brain substance. The whole brain-stem and mid-brain, with small portions of the cortex and cerebellum, were preserved for minute examination.

The abdominal and thoracic organs appeared healthy.”

Microscopic Observations.—“But for the universal congestion of all blood-vessels, the portions of the cortex and cerebellum examined and the mid-brain appeared healthy. The brain-stem, stained by Bielschowsky's method and counter-stained with acid fuchsin and methylene-blue, was examined exhaustively in serial section. A few very minute capillary ecchymoses were seen in the upper part of the pons and all the capillaries were much dilated, but except in the area just above the striæ acousticæ serious extravasation had not taken place. Into this region—just above the level of the olivary bodies and constituting the lower 2 mm. of the pons—five or six small hæmorrhages had occurred. The largest of these measured 2 × 1·5 × 1·25 mm. At its lower extremity it surrounded the apex of the right olive, and thence extended for 2 mm. upwards, outwards, and backwards towards the restiform body. This hæmorrhage caused damage to the formatio-reticularis, fillet, a small portion of the seventh nerve nucleus, and some fibres of the trapezium. A second extravasation of almost equal size was found in a nearly symmetrical situation on the left side.

Several other minute hæmorrhages were seen at this level in the formatio reticularis and in the restiform body. If one may apply to man the results obtained in cats[2] the hæmorrhages described above would temporarily, at any rate, have the same effect as section of the brain-stem just above the striæ at level 3, Fig. 1, and would determine the onset of the apneustic type of respiration, which is characterised by alternating periods of inspiratory tonus and gasping (Fig. 2).

FIG. 2.—*Respiration and Blood-Pressure Tracings in a Cat.*



Cut 1 was through the mid-brain; cut 2 at section 1, Fig. 1; cut 3 at section 2, Fig. 1. Inspiration upwards abscissa 12 mm. below time tracing (5 seconds).

In a series of ten cats in which the seventh and eighth nerves were severed intracranially, death, preceded by apneustic respiration and convulsions, resulted. That these results were not directly due to severance of the seventh and eighth nerves but to accidental hæmorrhages into the striæ region from dragging on the nerves, was conclusively proved. It was found that these nerves could be destroyed from the external auditory meatus without affecting the breathing, and if great care is taken not to drag on them the seventh and eighth nerves can, after removal of the cerebellum, be divided intracranially without causing pontine hæmorrhages or respiratory symptoms.

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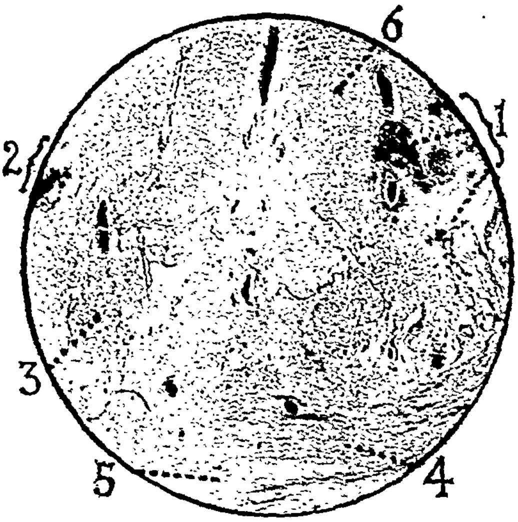
[2] Journal of Physiology, March, 1923.

It is not clear why hæmorrhages occurred in this case, but the feline experiments referred to above indicate that the pontine damage was sufficient to cause death by interference with the respiratory centres situated in the brain-stem above and at this level."

FIG. 3.—*Transverse Section of Brain-Stem just above Striæ Acousticæ.*



1. Largest hæmorrhage. 2. Smaller extravasation on left side. 3. Left pyramid. 4. Transverse fibres of lowest part of pons. 5. Median raphé with many dilated blood-vessels. 6. Right fillet. The unnumbered black spots are distended blood-vessels. Where a white space is seen, blood-clot has fallen out of a vessel or extravasation during section. (Microphotograph × about 10.)

Reference to Other Cases.

It is interesting to note that Still[3] records five cases of a somewhat similar nature. Four were boys; three were in the fourth to the eighth pregnancy. The attack came on without any reason while the infant was lying quietly in its cot. The onset was silent, without distress, and the infant simply ceased to breathe during the apnœic period. The infant had a healthy colour between the attacks, but there was some cyanosis during the attacks. In one of his cases there were four attacks in one day and two the next, and then the attacks ceased and the child recovered. In another there were six or seven attacks in the 24 hours and these continued to recur for seven days before death took place. In Still's cases one out of five recovered. On two of his cases there were necropsies; one showed some collapse of the bases and commencing broncho-pneumonic process, another case showed extensive atelectasis. He was of opinion that these might just as well have resulted from the condition as have caused the attacks. It seemed to him that the condition was more suggestive of some affection of the respiratory centre than of any secondary asphyxia from any insufficient expansion of the lung.

It is not difficult to imagine how over-lying or even foul play might be suspected in a case of this nature under certain circumstances. Looking back on several cases which have occurred in our experience during the last 25 years, we can recollect a few which had symptoms very similar to those described in the case under consideration. It is not unlikely that such cases are a little more frequent than might be supposed.

Cruickshank[4] draws attention to the pressure of the contracting uterine walls on the infant, also to the effects of accidental hæmorrhage, occlusion of umbilical vessels from twisting or prolapse. He states that the heart, continuing to beat, congestion becomes more marked, and that if no relief be obtained the congestion becomes so great that certain of the smaller vessels give way and petechiæ and capillary oozings appear in various situations. All these effects, he states, may be produced by asphyxial congestion alone, quite apart from the additional trauma of labour. He adds: "It is not surprising to find, then, that in a very large number of cases such hæmorrhages do exist." He is of the opinion that asphyxial congestion is the most usual factor in producing hæmorrhage, the pressure of the maternal passages being also very important, while "injuries due to abnormalities of presentation or to operative interference occupy the third, though still one of the important places in the ætiology of these lesions." We quite agree with Cruickshank that probably many infants with quite extensive birth hæmorrhages are born alive and survive, some perhaps to die from broncho-pneumonia and other common childish disorders later on.

Summary.

The important points are: The mother is a healthy primipara, aged 25, who enjoyed excellent health during pregnancy and labour. The labour was comparatively easy and natural. No drugs were given her; a few whiffs of chloroform just before the birth of the child only. There is no similar case in family. Cyanosis was present at birth, but passed off.

There was no asphyxia neonatorum. The infant was well formed, showed no abnormalities, and looked healthy. It took its food well and passed meconium and urine without trouble. There were slight although definite changes noted in the infant within the first 24 hours. These gradually increased in intensity.

Definite attacks of apnœa before the infant was two days old. Heart, lungs, air-passages normal. Twitchings and then convulsions. The infant looked well, and was of good colour, between attacks of apnœa; the cyanosis was only present during attacks. The effect of artificial respiration in cutting short the attacks.

Death within 12 hours of the first appearance of apnœa. The total number of attacks must have been more than a dozen.

Were the convulsions due to the slight changes found on the cortex cerebri or to respiratory failure? The clinical symptoms suggested an affection of the respiratory centre, yet at the necropsy there was comparatively little evidence macroscopically. Indeed, if it had not been for Thomas Lumsden's recent observations in the cat no further investigations would have been proceeded with.

The demonstration by Lumsden of hæmorrhages in the pons which first affected the pneumo-taxic and later the apneustic centres, causing death from respiratory failure. No changes were found in the heart or lungs post mortem. There were no signs of purpura.

The existence of greater frequency of hæmorrhages in the new-born, which was shown by Cruickshank, than has probably generally been entertained and therefore the likelihood that tiny hæmorrhages into the pons are perhaps not so infrequent in new-born infants as most observers believe.

That hæmorrhage into the pons is doubtless an unrecognised cause of death in certain infants.

Taking Still's reported five cases this one makes a fatality of five out of six.

It will be interesting to note if the after-history of cases which recover from this condition show demonstrable changes in the central nervous system.

The necessity of keeping the apnœic attacks in mind in deaths in newly-born infants thought to be due to over-lying or foul play.

The treatment in a definite case would appear to consist of artificial respiration and the use of oxygen during the attacks; keeping the child quiet and seeing that the bowels are kept properly open.

The prophylactic treatment obviously commends itself in the prevention of undue cerebral congestion

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[3] G. F. Still: Attacks of Arrested Respiration in the New-Born, THE LANCET, 1923, i., 431.

[4] J. N. Cruickshank: The Hæmorrhages of the New-Born, THE LANCET, 1923, i., 836.

He states further:—

"*Section in the Upper Part of the Pons.*—A section along line 2, Fig. 1, or at any point between lines 2 and 3, causes instantaneously a full development of the inspiratory type of breathing, and this happens whether the fifth and tenth nerves have been cut or not; a slow deep inspiration is taken, and the inspiratory position is held for two or even three minutes. During the last part of the time the muscles relax slowly, and finally give way suddenly. Two or three relatively quick respirations of abnormal type are then taken. Following these there is again a prolonged inspiration and so on. The cycle repeats itself with great regularity for, it may be, two or three hours, but the duration of the inspirations gradually lessens. The blood-pressure tracing taken simultaneously (Fig. 3 in *Journal* but Fig. 2 here) shows that during prolonged inspiration the arterial pressure first rises and later sinks to a low level. It rises again rapidly during the short period of relatively quick respirations."
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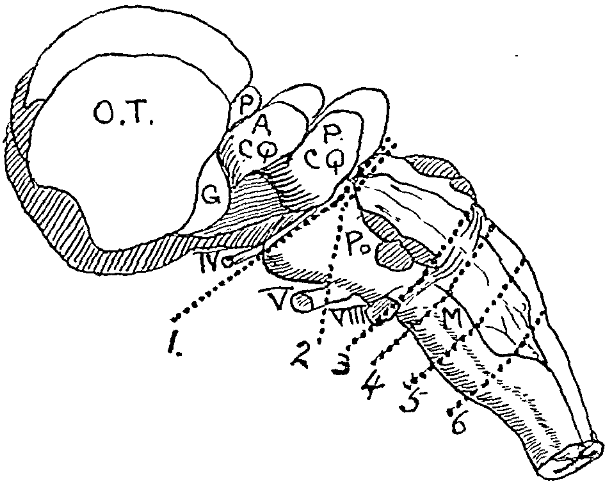

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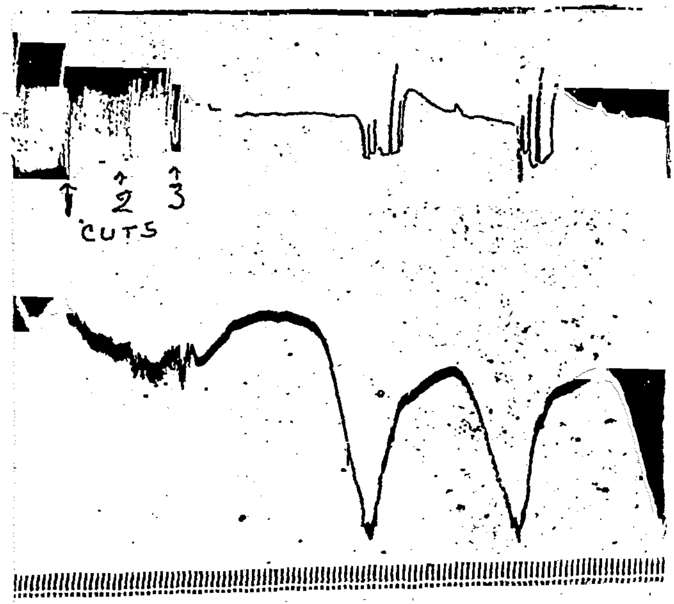
Several other minute hæmorrhages were seen at this level in the formatio reticularis and in the restiform body. If one may apply to man the results obtained in cats[2] the hæmorrhages described above would temporarily, at any rate, have the same effect as section of the brain-stem just above the striæ at level 3, Fig. 1, and would determine the onset of the apneustic type of respiration, which is characterised by alternating periods of inspiratory tonus and gasping (Fig. 2).

FIG. 2.—*Respiration and Blood-Pressure Tracings in a Cat.*



Cut 1 was through the mid-brain; cut 2 at section 1, Fig. 1; cut 3 at section 2, Fig. 1. Inspiration upwards abscissa 12 mm. below time tracing (5 seconds).

In a series of ten cats in which the seventh and eighth nerves were severed intracranially, death, preceded by apneustic respiration and convulsions, resulted. That these results were not directly due to severance of the seventh and eighth nerves but to accidental hæmorrhages into the striæ region from dragging on the nerves, was conclusively proved. It was found that these nerves could be destroyed from the external auditory meatus without affecting the breathing, and if great care is taken not to drag on them the nected to a further short piece of tubing by a metal elbow. Movement of the patient's head by the surgeon, however, or pressure on the lower jaw, may cause obstruction of the pharyngeal end of this tube at any time with some of the undesired effects described above. The satisfactory results obtained by passing an expiratory tube into the trachea alongside the catheter have led me to adopt this procedure where possible in every case in which endotracheal insufflation is the method of choice. Expiration as well as inspiration is brought directly under the control of the anæsthetist, and the pharynx can be as effectively plugged as desired.

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[2] *Journal of Physiology*, March, 1923.

When the mouth is available for the administration, catheter and expiratory tube can be fastened together and passed in one manœuvre. When the nose is the available channel, the catheter is passed through one nostril and the expiratory tube through the other, each being picked up in the oral pharynx with a forceps for the purpose[1] and passed into the trachea by direct vision. A suction pump is used in conjunction with this method to maintain a clear field when there is bleeding into the mouth or nose.

The course of the anæsthesia when conducted in this way is, in my experience, smoother than when a catheter alone is used, and its advantage to the surgeon is obvious. I understand that double channel catheters are used in some continental clinics, but in this country I have been unable to obtain any of sufficient (double) calibre for the purpose.

Sidcup.

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[1] Magill, I. W.: Brit. Med. Jour., 1920, ii., 670.

ACUTE KETOSIS DURING PREGNANCY.

BY J. HARGREAVES ROBINSON, L.A.H. DUB., L.M.R.C.P. IREL.

THE following case of acute ketosis of pregnancy is of interest by reason of its sudden and acute onset, and the happy issue under appropriate treatment.

A primipara, aged 32, during the seventh month of pregnancy developed a rapidly increasing anasarca in a few hours. Previous health excellent. Urine: amber colour, reaction acid, sp. gr. 1010. Albumin, trace; sugar, nil. Symptoms quickly increased in severity. There was cough due to œdema of the larynx, aphonia, lethargy, fibrillary tremors, pain and stiffness of the joints, irregular respiration during sleep, almost of the Cheyne-Stokes type, large circumscribed patches of transient erythema, severe stabbing pains in the hepatic region, sour taste, odour of acetone from the breath, spongy gums, sordes, ocular phenomena, which are now subjectively described as "something like the effect produced by opening the eyes under water and seeing for an instant moving shadows." Unilateral œdema of the face after sleeping on the side. Fœtal activity.

I am indebted to Dr. Cronin Lowe for the following report on the urine: Albumin present, but too small a quantity to estimate; reaction acid; acetone present; diacetic acid present; urea, 0·77 per cent.; ammonia, 0·15 per cent.; ammonia coefficient, 1 to 5·1. Centrifuged deposit: Pus cells, a few; blood cells, nil; casts, nil; epithelial cells present.

The clinical condition increased in severity, and Dr. Leith Murray passed bougies into the uterus to induce labour. On removal of the bougies the membranes were ruptured, and six hours later Dr. Philip Vickers delivered with forceps without an anæsthetic. Two sutures (20 day chromic catgut) were inserted into the perineum; they dissolved out on the fifth day, and left a peculiar depressed areola about ¼ in. in diameter at the site of insertion. Sodii bicarb. ¼ lb. was given during the three days preceding delivery. The following were also given: Calcium lactate ½ drm. daily; ol. ricini 2 oz. at the onset of the condition; 12 hours later sodii sulphas ¼ oz., and subsequently 1 drm. doses three-hourly; rectal salines. The urine became alkaline four days after delivery. The infant (weight 5 lb. 6 oz.) showed transient patches of erythema during the first week after birth. In consequence of the small capacity of the stomach at birth the infant was fed two-hourly on undiluted cow's milk, with sodii citras 3½ gr., gradually increased to 6 gr. in each feed. Eleven feeds in the 24 hours. Body-weight at 14 weeks, 13 lb.

The mother's recovery was uneventful.

Southport.

BRONZED DIABETES:

ITS REACTION TO DIETETIC AND INSULIN TREATMENT.

BY E. BOSDIN LEECH, M.D. CAMB., F.R.C.P. LOND.,
HONORARY PHYSICIAN, MANCHESTER ROYAL INFIRMARY.

THE origin of bronzed diabetes is still unknown. The case here recorded was not diagnosed till after death, and during life the patient received the modern diabetic treatment as carried on at the Manchester Royal Infirmary. It is of interest to see how he responded to that treatment.

A male, aged 47, was admitted to hospital on May 5th, 1923, with acute diabetes of three months' standing. During life there was no definite skin pigmentation and the skin was sallow or possibly slightly icteric. From May 9th to June 12th he was treated dietetically on the lines of the Allen treatment. May 9th to 11th, preliminary diet; 12th to 15th, fluid (starvation) diet. On this the sugar disappeared. The caloric value of the food was then gradually raised, but sugar appeared on the 18th (with 327 cal.), 22nd (360 cal.) lasting four days; June 4th (952 cal.) and 8th (952 cal.). The blood-sugar results during this time were: May 9th 0·2816 per cent., 29th 0·1968 per cent.; June 10th 0·2816 per cent. About the last-named date the patient developed œdema and ascites, and it was evident that he was not going to improve with simple dietetic treatment. It had not been possible to train him up to take even 952 calories daily. Insulin was therefore given, 15 units daily, 10 at 8.30 A.M. and 5 at 6.30 P.M. A diet was given with caloric value 2183, later reduced to 1683. With this a trace of sugar persisted. Numerous blood-sugar estimations varied from 0·0625 on the first day of insulin treatment to 0·2062 on June 19th.

The patient never showed any improvement with the insulin, but became weaker, more emaciated, and more water-logged. On June 25th he refused food and the insulin was of necessity discontinued. He died on the 27th.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

MATERNITY AND CHILD WELFARE GROUP.

A MEETING of this group was held on July 3rd at 117, Piccadilly, W., Dr. H. K. WALLER, the retiring President, being in the chair.

In the absence of Prof. E. MELLANBY, Dr. ERIC PRITCHARD opened a discussion on the

Feeding of Infants between the Ages of 1 and 5 Years.

He said that during the last ten years more important discoveries had been made as regards diet than in the previous 10,000 years. The present knowledge was derived chiefly from animal experimentation, since many generations of animals could come under observation, whereas the difficulty of working with humans was that the results of indiscretions were not shown in one generation; in vitamin deficiency, for example, it might take long before any change was noticeable. At the beginning of the study of scientific dietetics energy value of food was alone regarded as important, on the analogy of the needs of a machine. This analogy was true in many respects, but no machine was able to repair, enlarge, modify, or reproduce itself, and if some were made to lubricate themselves they could not, at any rate, clean, stimulate, and protect themselves against external injuries. The human body was required to do all these things and diet had to provide much besides energy value. Milk was an adequate and sufficient food for the human body for the first 12 months of life. The biological value of proteins was now known to differ greatly, and attempts made to classify foods on this basis resulted in a table in which meat stood highest, from too prolonged a labour on the one hand and the avoidance of undue interference on the other. Even most careful steering between Scylla and Charybdis would probably not prevent some cases; possibly there is an innate peculiarity of the blood-vessels in them. Again, we know that some infants who have suffered from fairly bad asphyxia neonatorum show no abnormality later in life. It would be interesting to hear the views of others who have had *similar cases.*

Our thanks are due to Dr. Lumsden for the great help he has given, not only by his observations on cats, but by his investigations in this case.

THE MODE OF TRANSMISSION OF MALARIA:

A HYPOTHESIS ADVANCED BY RICHARD PFEIFFER IN 1892.[1]

BY C. M. WENYON, C.M.G., C.B.E., M.B., B.S., B.SC. LOND.,

DIRECTOR OF RESEARCH IN THE TROPICS TO THE WELLCOME BUREAU OF SCIENTIFIC RESEARCH.

OF the various conjectures on the mode of transmission of malaria which were made prior to the work of Manson and Ross, and the actual demonstration of the mosquito cycle of the parasite of this disease, that of Richard Pfeiffer appears to be the one most logically argued, most accurately deduced, and nearest the truth in the light of subsequent discoveries. Pfeiffer's remarks appear to have been entirely overlooked, probably because they were included in a paper dealing with another subject. The accuracy of Pfeiffer's reasoning is remarkable. It was based on the knowledge gained from a study of the common coccidium of the rabbit, and the scientific mind of Pfeiffer realised the possibility of the parasite of malaria having a similar life-cycle which completed itself, not on the ground in a protective oöcyst, but in the body of some blood-sucking invertebrate which might inoculate the germs thus produced into human beings. The similarity of the reproductive phase of the coccidia in the epithelial cells which they destroyed and that of the malarial parasite in the red blood corpuscles, together with the absence, in the case of the malaria parasites, of any resistant stage which could compare with the oöcysts of coccidia, led Pfeiffer to the view that in some blood-sucking insect lay hidden the secret of the transmission of malaria.

During the years 1889–90 this observer occupied himself with a study of the common coccidium of the rabbit. His paper, illustrated by excellent microphotographs, was published in 1892, and forms a landmark in our knowledge of these parasites. Hitherto it had been assumed that the sporulation of coccidia in the epithelium, and that in the oöcyst after it had left the body, represented two distinct parasites. To Richard Pfeiffer is due the credit of having first demonstrated that these were merely phases of one and the same organism. Sporulation in the epithelium led to multiplication within the host, while that in the oöcyst had to do with the spread of infection to another animal. The resistant oöcyst protected the parasite during its development outside the body. To Pfeiffer the endogenous sporulation of coccidia and malarial parasites were alike, while the absence of an oöcyst in the latter suggested the possibility of the exogenous cycle taking place while protected by some insect's body.

The following is a fairly literal translation of the final paragraph of Pfeiffer's most interesting and important work on the coccidia of the rabbit:—

> As a result of the discoveries of Laveran, Marchiafava, Celli, and Golgi, it is known that in malarial fever the red blood corpuscles harbour characteristic motile amœboid bodies which increase in size, bring about destruction of the occupied cell, and then, at regular intervals, as a result of segmentation associated with the formation of a residual body, produce numerous young individuals, which in their turn always give rise to a new generation of blood parasites. So far all is clear. But how does the parasite gain entrance to the human body? It is possible to produce the fever in healthy men, as was first shown by Gerhardt, by the injection of small quantities of blood from a person suffering from malaria. Without going into this matter further, it is clear that *under no condition can this be* the normal mode of infection. On the other hand, all epidemiological experience indicates a close connexion between marsh-fever and special conditions of the soil. *The first and most* evident idea was that in some way the blood parasite concerned was present in the soil or in the water of the infected locality, and that it attacked man as a result of inhalation or by way of the digestive tract. But all investigations which have been conducted *along this* line have remained without result. This is no longer surprising since we have learnt that the blood parasitising protozoa are extraordinarily delicate, and are entirely unsuited for a free life in the *outer* world. *Grassi's* hypothesis that the widely distributed amœbæ of marsh water enter the blood of man, transform themselves into malarial parasites and, as a result of adaptation to the existing conditions, lose their power of existing as free living organisms, is *based on so forced a supposition and receives* so little support from experiment, that it does not indicate a way out of the prevailing difficulty. How then is the undoubted dependence of malarial infection on environment to be explained? The following solution suggests *itself, but I bring it forward only as a* hypothesis, the justification for which rests in the fact that it indicates a line of investigation. It is possible that in the case of the malarial parasite also there exists an exogenous phase, *a* developmental cycle which completes itself outside the human host, possibly in the body of a lower animal (as, for instance, certain insects) and possibly also, in part at least, in the soil. This exogenous malarial germ could then be conveyed to man through *the air or water, or as* Robert Koch has *remarked* to me, through the sting of blood-sucking insects.

The reasoning is so sound, and has been so completely justified by subsequent investigations, not only on the life-history of the malarial parasite itself, but also by the discovery of the close relationship which exists between malarial parasites and coccidia, that it seems *worth while to call* attention to Pfeiffer's remarks.

Clinical and Laboratory Notes.

THE PROVISION FOR EXPIRATION IN ENDOTRACHEAL INSUFFLATION ANÆSTHESIA.

BY I. W. MAGILL, M.B., B.CH., B.A.O. BELF.,

SENIOR ANÆSTHETIST, QUEEN'S HOSPITAL, SIDCUP; HONORARY ANÆSTHETIST, BROMPTON HOSPITAL FOR CONSUMPTION.

THE value of endotracheal insufflation anæsthesia for operations in the region *of the* head and neck is *too* well known to require any comment. In certain cases, however, particularly those in which the method is specially indicated—namely, *operations* involving the *lower* jaw and mouth—lack of adequate provision for expiration may, by its effect on the patient, interrupt the course of a smooth *anæsthesia* or embarrass the work of the surgeon.

(1) With regard to the patient, partial respiratory obstruction due to *the falling back of the tongue*, pressure *on* the lower jaw, or other cause, may produce a form of hyperpnœa with laboured expiration, consequent congestion, and increased *hæmorrhage* at the site of the operation.

(2) With regard to the surgeon, to operate under the full force of the patient's anæsthetic-*laden* expirations is *at least* unpleasant. When there is bleeding into the mouth or upper air-passages the additional accompaniment of a spray of blood is unlikely *to* assist either his *temper* or his technique.

These effects may be counteracted in many instances by means of a firm-walled rubber tube of *sufficient* calibre passed into the pharynx through the mouth or nose, according to the site of the operation, and con-

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[1] Pfeiffer, R. (1892): Beiträge zur Protozoen-Forschung, I. Heft Die Coccidien-Krankheit der Kaninchen, Berlin.

Reviews and Notices of Books.

ENCYCLOPÆDIA MEDICA.

Second edition. Vol. IX., Mammillaplasty to Obesity. General Editors, Vols. I.–VIII., the late J. W. BALLANTYNE, M.D., C.M., F.R.C.P.E.; Vol. IX., ALEXANDER GOODALL, M.D., F.R.C.P.E. London and Edinburgh: W. Green and Son, Ltd. 1923. Pp. 672. 30*s*.

Dr. J. W. Ballantyne, who edited the first eight volumes of the second edition of the Encyclopædia Medica, died in January last, and this regrettable event has, we are informed, delayed the appearance of this volume. The references in many of the articles are, indeed, not to very recent work, though the spirit of most of them is modern. The publishers announce that they were able to secure the editorial services of Dr. Alexander Goodall, for the completion of this and the remaining volumes of the series, of which the publication is expected to be completed next year. Vol. IX. maintains the standard of previous instalments. Notable among those articles revised by the original authors are those on Forensic Medicine, by Prof. Harvey Littlejohn, on Infections of the Nails, by Dr. George Pernet, on Occupation Neuroses, by Dr. Wilfred Harris, and on Acute Inflammations of the Nose, by Mr. Herbert Tilley. It is natural that auto-revision should give the best result, for the introduction of a revising hand, although essential in certain cases, can hardly fail to alter, though perhaps very slightly, the point of view of the original writer. Specially successful, however, is the revision by Dr. C. B. Ker of the section on Epidemic Cerebro-Spinal Meningitis by the late Sir William Osler, and that by Dr. W. A. Potts on Mental Deficiency, written by Dr. G. E. Shuttleworth. New articles are those on Military Surgery, by Sir D'Arcy Power, Mycetoma, by Major W. S. Patton, I.M.S. (ret.), and Neurasthenia, by Dr. Ivy M'Kenzie. We regret that the list of principal articles in the volume, with the names of authors or revisers, is not supplemented by an index of the authors of short articles on subjects of smaller range though by no means necessarily of less importance. Some of these shorter articles, notably one on Masturbation, appear to be most admirable summaries of the subject dealt with, and since the views expressed are not free from controversy, an indication of the name of the author would give confidence to those who hold the same opinions. This is almost the only omission in an admirable volume.

CLINICAL DIAGNOSIS OF INTERNAL DISEASES.

By LLEWELLYS F. BARKER, M.D., LL.D., Professor of Clinical Medicine, Johns Hopkins University. In three volumes. London and New York. D. Appleton and Co. 1923. Pp. 2908. £5.

THESE three volumes originally formed part of a series of six, entitled Monographic Medicine, published in 1916. In a foreword it is stated that they have been republished separately in response to "requests from various quarters." The first feeling produced on looking through the republished volumes is curiosity as to what could have formed the subject-matter of the remainder; for Prof. Barker takes all medical knowledge for his province, even including in his monograph conditions such as ringworm and chronic mastitis, which hardly seem to merit the designation "internal." In an introduction, written in 1916, the author points out that the present-day physician, or "internist" as he prefers to call him, is, or at any rate should be, engaged in "attempting to visualise clearly the functional pathological processes that are the essence of disease." His aim in writing has been to supply information as to methods and procedures available for following these functional pathological processes. This involves the description of the means employed in the investigation of cases in all the fields of medicine, an undertaking of such vast extent that it is amazing that one man should have been found capable of attempting it. That Prof. Barker did attempt it single-handed was due to his belief that "the problems of selection of matter for such a work as the present are such that they can best be met by one man, provided that he has had large clinical experience, some years of laboratory training, and has always been in close touch with clinical workers." Such a man—we had almost said superman—the author would certainly appear to be, and in 1916 the present work must have been nothing short of prodigious. The whole field of diagnosis was covered, so far as it had then been mapped—roentgenology, bacteriology, hæmatology, biochemistry, and biophysics; with all of them the author displayed an equal and astonishing familiarity, and laid before his readers the fruits of the latest work. But that was in 1916, and now it is 1923, and the volumes have apparently been reprinted without further comment, without withdrawal or addition, and with no reference under seven years' old.

Perusal of the work to-day is, in some respects, encouraging. It serves to convince that in spite of cavillers, medicine, so far at any rate as diagnosis is concerned, does move. Prof. Barker's work was in the very forefront of the advancing tide in 1916; in 1923 that tide has flowed far beyond. No doubt it has carried a good deal of worthless flotsam with it, but it has also borne many things of real value. Among these may be mentioned the newer knowledge of the accessory food factors and their relation to the deficiency diseases; the recognition of the curative powers of the actinic rays of sunlight in rickets; the more recent methods of estimating the sugar in the blood, which have made it possible for even the general practitioner with some biochemical training to distinguish true diabetes from the various glycosurias and to follow the condition of his diabetic patients as never before; the simplified urea tests for the gauging of renal functions; the estimation of thyroid overaction or deficiency by observations on the basal metabolism—and the list might be prolonged a good deal further.

It is justifiable to question the wisdom of Prof. Barker in allowing his book to be reprinted even in response to the urgency of its admirers until he or someone else had brought it up to date. It would be unkind further to insist upon the lapses of omission and inclusion incident upon the production in 1923 of a work completed in 1916, and apart from these nothing but matter for admiration remains in Prof. Barker's book. The descriptions of all the well-established clinical methods are excellent. In his zeal for more modern methods the author has not neglected the older modes of investigation, and his description of physical signs of all types and descriptions are masterly. On the main clinical features of every disease he may wish to investigate the practitioner or student could have no better guide than Llewellys Barker.

MEDICAL DIETETICS.

Vorlesungen über Diätbehandlung innerer Krankheiten. Fourth edition. By Prof. H. STRAUSS, Berlin Jewish Hospital. Berlin: S. Karger. 1922. Pp. 471.

Prof. H. Strauss's volume, which has reached a fourth edition, gives in the form of 17 lectures a thoughtful and thorough exposition of the principles which should guide the physician in prescribing food in the commoner diseases. The dietetic treatment of alimentary disorders naturally takes up a good part of the volume. But circulatory and kidney diseases, gout, diabetes, obesity, infectious diseases, and post-operative diets also receive full attention. The tables of analyses at the end are exhaustive and are cast into a useful form, giving the calories, protein, fat, carbohydrate, and water in 100 g. of each food, both raw and as served at the table. Special mention must be made of the valuable appendix of hints for the dietetic kitchen by Elise Hannemann. This contains nearly 100 pages of good recipes; and of

followed in order by milk, wheat, lentils, beans, and maize, which had a biological protein value only one-third of that of good meat. This might account for the pellagrins in certain parts of America and elsewhere if maize was the staple diet. Besides biological value mineral elements were important; too much attention had recently been centred on vitamins, which were no more essential than iodine or soda. The depletion of alkali reserve, which could be restored by mineral matter in organic combination, was responsible for much ill-health, which a more liberal allowance of fruit would cure. E. V. McCollum in a recent book had given three elements of a safe dietary: (1) Milk; (2) small-leaved green vegetables and fruits, for their salts, bases, and vitamins; and (3) offal, of which the biological protein value was much higher than, for example, that of fish. The real essential was not to concentrate on any one aspect of the subject, but to plan a diet bearing in mind energy value, balance, salts, vitamins, and also digestibility and favourable distribution of meals.

Dr. Waller raised for discussion a particular point in the dietetics of young children—viz., the place occupied by cow's milk in the rearing of infants at and shortly after the weaning age. He suggested that if a certain prevalent view is correct, then the baby is unique among young mammals in requiring prolonged milk feeding long after its own mother is capable of the task. For delicate children and for those short of proper nourishment milk is an invaluable remedy. But he held that large numbers of working-class parents, who give their children little or no cow's milk after weaning, show that healthy infants can be reared in this manner. He raised the question for two reasons. The first was that he thought the secret of this type of feeding was worth examining in view of its obvious success. The second was that it differed radically from the manner of feeding commonly prescribed by doctors and nurses for children in the nurseries of the well-to-do—often with an equally obvious lack of success. There might well be a danger that, owing to the growing authority of the infant welfare movement, this tendency to prolonged milk feeding of the young might be too rigidly imposed on the class of parents attending infant clinics with certain disadvantages. He feared a repetition of the unfortunate situation which occurred when two-hourly breast-feeding was widely ordered only to be laboriously cancelled when its drawbacks were appreciated. He wished to emphasise that he referred to children in good health at the normal weaning age, not to invalids or those who could not get food. For these latter types the artisan parent's view that milk is an excellent medicine is correct. But he believed we should keep this medicinal aspect in mind and not lose sight of the fact that an alternative, and biologically a more natural, diet can be framed.

Dr. H. Scurfield, who was elected President of the group for 1923–24, spoke of the varied opinions of well-known pædiatricians on a diet suitable for young children. One considered bananas indigestible, another objected to raw tomatoes and cucumber for children under 7. Dr. Scurfield's own children had all eaten cucumber before they were 2. In contradiction to Dr. Waller's views, McCollum had tried to show that the physique of races who had lived on dairy produce for thousands of years was better than that of others. McCollum's estimate of the amount of milk that should be consumed daily by an adult was a quart; Mellanby suggested a pint. In connexion with vitamins, Dr. Scurfield referred to Dr. W. Cramer's researches,[1] and said that experiments on feeding poultry confirmed his conclusions as to the beneficial results of a diet especially rich in vitamins. The fact that no variation in the composition of human milk was noticeable in tropical climates rather spoilt the theory that milk was adapted to the child's needs under all circumstances; in this case one would expect the fat content to be lessened in hot climates. Dr. Scurfield drew attention to the high temperatures to which milk was subjected in the process of making Devonshire cream, which might be said to be made from pasteurised milk.

Dr. Mabel Brodie drew attention to the fact that in many districts the mothers could not afford to buy cow's milk or dried milk for infants who had been weaned. Many young children could not digest uncooked vegetables, and few were given any meat until between 4 and 5. She asked when normal children should first be given meat.

Dr. Maitland Radford said that the assumption that milk was necessary for young children was of great administrative importance, exemplified by Ministry of Health orders. The Ministry paid half the cost of giving away a considerable amount of milk to expectant and nursing mothers and children under 5. If Dr. Waller's theories were correct, they might do much better with the money.

Dr. H. P. Newsholme asked how mothers were to be instructed. Of recent years research had increasingly emphasised the value of green vegetables and the use of cereals as a main source of diet was being deprecated. The question was not yet decided, however, whether the older method of feeding was practicable in modern times, or even beneficial nowadays. The increase in consumption of cereals by a town population was dependent on their easy carriage, whereas fresh country produce was difficult to convey. Cereals were not ideal foods, but were useful in energy content and could easily be supplemented by "safety" foods.

Dr. C. L. Williams (Todmorden) said that Gowland Hopkins's "Law of the Minimum" had crept into a few text-books, but it was not generally realised how wide were the possible variations in acceptable dietaries. Dogmatism at this stage of our knowledge must be avoided. The essential elements in diet could be bought for a few pence and the rest could be chosen to suit individual taste. For example, there was nothing particularly evil about fish and chips as an article of diet, but when children were given fish and chips only protest must be made.

Dr. Mary Kidd contended that milk could not be dispensed with, and attributed our C 3 population to the tardy effects of under or defective feeding of children. The action of the Ministry of Health in providing milk should not be discouraged, though Dr. Waller's views should be borne in mind.

Dr. E. H. T. Nash (Isleworth) pointed out the difference in nutritive value and digestibility between bananas and plantains.

Dr. Stella Churchill said that since medical men had not interested themselves in the matter of the diet of healthy young children until recent years, much could be learnt by observing the way of tradition. An important point was to give children what they liked to eat. If greens were given early enough children liked them, also meat, chicken, or fish, but they did not as a rule like milk or suet puddings. Tomatoes, cucumbers after the age of 2, and eggs were better than cereals.

Reply.

Dr. Waller pointed out that he did not doubt the enormous value of milk for delicate children. In his opinion statistics showed that it was a mistake to keep children on a fluid diet.

Dr. Pritchard said that he thoroughly agreed with Dr. Newsholme's remarks. One after another cheap food was being discarded or excluded from dietaries because it contained no vitamins; this was ridiculous since vitamins could easily be supplied separately in concentrated form, as in fruit juice, cod-liver oil, and marmite. Separated milk was an excellent foodstuff properly supplemented. The discrediting of Marylebone cream, in spite of its acknowledged energy value, on the count of absence of vitamins appeared to him pure folly. "Get your cheap vitamins somewhere else, but don't condemn good foods" was Dr. Pritchard's concluding message.

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[1] The Lancet, 1921, ii., 1202; Ibid., 1923, i., 1046.

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ENCYCLOPÆDIA MEDICA.

Second edition. Vol. IX., Mammillaplasty to Obesity. General Editors, Vols. I.–VIII., the late J. W. BALLANTYNE, M.D., C.M., F.R.C.P.E.; Vol. IX., ALEXANDER GOODALL, M.D., F.R.C.P.E. London and Edinburgh: W. Green and Son, Ltd. 1923. Pp. 672. 30s.

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CLINICAL DIAGNOSIS OF INTERNAL DISEASES.

By LLEWELLYS F. BARKER, M.D., LL.D., Professor of Clinical Medicine, Johns Hopkins University. In three volumes. London and New York. D. Appleton and Co. 1923. Pp. 2908. £5.

THESE three volumes originally formed part of a series of six, entitled Monographic Medicine, published in 1916. In a foreword it is stated that they have been republished separately in response to "requests from various quarters." The first feeling produced on looking through the republished volumes is curiosity as to what could have formed the subject-matter of the remainder; for Prof. Barker takes all medical knowledge for his province, even including in his monograph conditions such as ringworm and chronic mastitis, which hardly seem to merit the designation "internal." In an introduction, written in 1916, the author points out that the present-day physician, or "internist" as he prefers to call him, is, or at any rate should be, engaged in "attempting to visualise clearly the functional pathological processes that are the essence of disease." His aim in writing has been to supply information as to methods and procedures available for following these functional pathological processes. This involves the description of the means employed in the investigation of cases in all the fields of medicine, an undertaking of such vast extent that it is amazing that one man should have been found capable of attempting it. That Prof. Barker did attempt it single-handed was due to his belief that "the problems of selection of matter for such a work as the present are such that they can best be met by one man, provided that he has had large clinical experience, some years of laboratory training, and has always been in close touch with clinical workers." Such a man—we had almost said superman—the author would certainly appear to be, and in 1916 the present work must have been nothing short of prodigious. The whole field of diagnosis was covered, so far as it had then been mapped—roentgenology, bacteriology, hæmatology, biochemistry, and biophysics; with all of them the author displayed an equal and astonishing familiarity, and laid before his readers the fruits of the latest work. But that was in 1916, and now it is 1923, and the volumes have apparently been reprinted without further comment, without withdrawal or addition, and with no reference under seven years' old.

Perusal of the work to-day is, in some respects, encouraging. It serves to convince that in spite of cavillers, medicine, so far at any rate as diagnosis is concerned, does move. Prof. Barker's work was in the very forefront of the advancing tide in 1916; in 1923 that tide has flowed far beyond. No doubt it has carried a good deal of worthless flotsam with it, but it has also borne many things of real value. Among these may be mentioned the newer knowledge of the accessory food factors and their relation to the deficiency diseases; the recognition of the curative powers of the actinic rays of sunlight in rickets; the more recent methods of estimating the sugar in the blood, which have made it possible for even the general practitioner with some biochemical training to distinguish true diabetes from the various glycosurias and to follow the condition of his diabetic patients as never before; the simplified urea tests for the gauging of renal functions; the estimation of thyroid overaction or deficiency by observations on the basal metabolism—and the list might be prolonged a good deal further.

It is justifiable to question the wisdom of Prof. Barker in allowing his book to be reprinted even in response to the urgency of its admirers until he or someone else had brought it up to date. It would be unkind further to insist upon the lapses of omission and inclusion incident upon the production in 1923 of a work completed in 1916, and apart from these nothing but matter for admiration remains in Prof. Barker's book. The descriptions of all the well-established clinical methods are excellent. In his zeal for more modern methods the author has not neglected the older modes of investigation, and his description of physical signs of all types and descriptions are masterly. On the main clinical features of every disease he may wish to investigate the practitioner or student could have no better guide than Llewellys Barker.

MEDICAL DIETETICS.

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Prof. H. Strauss's volume, which has reached a fourth edition, gives in the form of 17 lectures a thoughtful and thorough exposition of the principles which should guide the physician in prescribing food in the commoner diseases. The dietetic treatment of alimentary disorders naturally takes up a good part of the volume. But circulatory and kidney diseases, gout, diabetes, obesity, infectious diseases, and post-operative diets also receive full attention. The tables of analyses at the end are exhaustive and are cast into a useful form, giving the calories, protein, fat, carbohydrate, and water in 100 g. of each food, both raw and as served at the table. Special mention must be made of the valuable appendix of hints for the dietetic kitchen by Elise Hannemann. This contains nearly 100 pages of good recipes; and of

followed in order by milk, wheat, lentils, beans, and maize, which had a biological protein value only one-third of that of good meat. This might account for the pellagrins in certain parts of America and elsewhere if maize was the staple diet. Besides biological value mineral elements were important; too much attention had recently been centred on vitamins, which were no more essential than iodine or soda. The depletion of alkali reserve, which could be restored by mineral matter in organic combination, was responsible for much ill-health, which a more liberal allowance of fruit would cure. E. V. McCollum in a recent book had given three elements of a safe dietary: (1) Milk; (2) small-leaved green vegetables and fruits, for their salts, bases, and vitamins; and (3) offal, of which the biological protein value was much higher than, for example, that of fish. The real essential was not to concentrate on any one aspect of the subject, but to plan a diet bearing in mind energy value, balance, salts, vitamins, and also digestibility and favourable distribution of meals.

Dr. Waller raised for discussion a particular point in the dietetics of young children—viz., the place occupied by cow's milk in the rearing of infants at and shortly after the weaning age. He suggested that if a certain prevalent view is correct, then the baby is unique among young mammals in requiring prolonged milk feeding long after its own mother is capable of the task. For delicate children and for those short of proper nourishment milk is an invaluable remedy. But he held that large numbers of working-class parents, who give their children little or no cow's milk after weaning, show that healthy infants can be reared in this manner. He raised the question for two reasons. The first was that he thought the secret of this type of feeding was worth examining in view of its obvious success. The second was that it differed radically from the manner of feeding commonly prescribed by doctors and nurses for children in the nurseries of the well-to-do—often with an equally obvious lack of success. There might well be a danger that, owing to the growing authority of the infant welfare movement, this tendency to prolonged milk feeding of the young might be too rigidly imposed on the class of parents attending infant clinics with certain disadvantages. He feared a repetition of the unfortunate situation which occurred when two-hourly breast-feeding was widely ordered only to be laboriously cancelled when its drawbacks were appreciated. He wished to emphasise that he referred to children in good health at the normal weaning age, not to invalids or those who could not get food. For these latter types the artisan parent's view that milk is an excellent medicine is correct. But he believed we should keep this medicinal aspect in mind and not lose sight of the fact that an alternative, and biologically a more natural, diet can be framed.

Dr. H. Scurfield, who was elected President of the group for 1923–24, spoke of the varied opinions of well-known pædiatricians on a diet suitable for young children. One considered bananas indigestible, another objected to raw tomatoes and cucumber for children under 7. Dr. Scurfield's own children had all eaten cucumber before they were 2. In contradiction to Dr. Waller's views, McCollum had tried to show that the physique of races who had lived on dairy produce for thousands of years was better than that of others. McCollum's estimate of the amount of milk that should be consumed daily by an adult was a quart; Mellanby suggested a pint. In connexion with vitamins, Dr. Scurfield referred to Dr. W. Cramer's researches,[1] and said that experiments on feeding poultry confirmed his conclusions as to the beneficial results of a diet especially rich in vitamins. The fact that no variation in the composition of human milk was noticeable in tropical climates rather spoilt the theory that milk was adapted to the child's needs under all circumstances; in this case one would expect the fat content to be lessened in hot climates. Dr. Scurfield drew attention to the high temperatures to which milk was subjected in the process of making Devonshire cream, which might be said to be made from pasteurised milk.

Dr. Mabel Brodie drew attention to the fact that in many districts the mothers could not afford to buy cow's milk or dried milk for infants who had been weaned. Many young children could not digest uncooked vegetables, and few were given any meat until between 4 and 5. She asked when normal children should first be given meat.

Dr. Maitland Radford said that the assumption that milk was necessary for young children was of great administrative importance, exemplified by Ministry of Health orders. The Ministry paid half the cost of giving away a considerable amount of milk to expectant and nursing mothers and children under 5. If Dr. Waller's theories were correct, they might do much better with the money.

Dr. H. P. Newsholme asked how mothers were to be instructed. Of recent years research had increasingly emphasised the value of green vegetables and the use of cereals as a main source of diet was being deprecated. The question was not yet decided, however, whether the older method of feeding was practicable in modern times, or even beneficial nowadays. The increase in consumption of cereals by a town population was dependent on their easy carriage, whereas fresh country produce was difficult to convey. Cereals were not ideal foods, but were useful in energy content and could easily be supplemented by "safety" foods.

Dr. C. L. Williams (Todmorden) said that Gowland Hopkins's "Law of the Minimum" had crept into a few text-books, but it was not generally realised how wide were the possible variations in acceptable dietaries. Dogmatism at this stage of our knowledge must be avoided. The essential elements in diet could be bought for a few pence and the rest could be chosen to suit individual taste. For example, there was nothing particularly evil about fish and chips as an article of diet, but when children were given fish and chips only protest must be made.

Dr. Mary Kidd contended that milk could not be dispensed with, and attributed our C 3 population to the tardy effects of under or defective feeding of children. The action of the Ministry of Health in providing milk should not be discouraged, though Dr. Waller's views should be borne in mind.

Dr. E. H. T. Nash (Isleworth) pointed out the difference in nutritive value and digestibility between bananas and plantains.

Dr. Stella Churchill said that since medical men had not interested themselves in the matter of the diet of healthy young children until recent years, much could be learnt by observing the way of tradition. An important point was to give children what they liked to eat. If greens were given early enough children liked them, also meat, chicken, or fish, but they did not as a rule like milk or suet puddings. Tomatoes, cucumbers after the age of 2, and eggs were better than cereals.

Reply.

Dr. Waller pointed out that he did not doubt the enormous value of milk for delicate children. In his opinion statistics showed that it was a mistake to keep children on a fluid diet.

Dr. Pritchard said that he thoroughly agreed with Dr. Newsholme's remarks. One after another cheap food was being discarded or excluded from dietaries because it contained no vitamins; this was ridiculous since vitamins could easily be supplied separately in concentrated form, as in fruit juice, cod-liver oil, and marmite. Separated milk was an excellent foodstuff properly supplemented. The discrediting of Marylebone cream, in spite of its acknowledged energy value, on the count of absence of vitamins appeared to him pure folly. "Get your cheap vitamins somewhere else, but don't condemn good foods" was Dr. Pritchard's concluding message.

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[1] The Lancet, 1921, ii., 1202; Ibid., 1923, i., 1046.

Reviews and Notices of Books.

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each the composition and the food value are stated. The author rightly asserts that for the dietetic treatment of constipation an exact diagnosis is of first importance. The causes are various; and loss of the power of expulsion is seldom one of them. The delay may be due to atony, to spasm, or to weakness of the abdominal walls, and may be complicated by stenosis, by mucous colitis, or by piles. We notice that the use of X rays to determine the actual nature and seat of the delay is not mentioned. For the spastic forms of constipation a diet calculated to render the motions soft, but poor in cellulose, is advised. It would contain little or no meat, abundance of fruit juices and jellies, honey, whey, buttermilk or sour milk, milk-sugar, lævulose, olive oil, paraffin or agar-agar. For the torpid forms of constipation the usual wholemeal bread, salads, and fruits are recommended. In mucous colitis the cellulose-poor anti-constipation diet is first tried, and later, if needed, a cellulose-rich diet as advocated by v. Noorden.

In speaking of diet in kidney disease Prof. Strauss lays stress on the fact that in many cases of nephritis there is no demonstrable impairment of renal function. There may be a harmless "anephritic" albuminuria. The quantity of albumin is not indeed of value as a guide to the severity of chronic nephritis; neither has diet such a definite influence upon it as was formerly supposed. He doubts also if small quantities of spices and condiments have any adverse effect on the kidney. The reader cannot fail to note Prof. Strauss's practical acquaintance with the phases and consequences of starvation. The copious details offer an arresting contrast to the pre-war literature of a few references to special fasting experiments. We may hope that Europe will see no more of hunger-osteopathy and hunger-œdema. In treating sub-nutrition exercise is valuable. Weak and very thin patients should begin their treatment in bed, but the muscles must be kept in condition by massage, faradisation, and exercises. In the chapter on diabetes the various methods of dieting are discussed in general terms, but few specific instructions, such as the doctor really needs, are given. The analyses of foods are stated in percentages as a rule, though there is one useful table which gives the weights of various foods containing the same quantity of carbohydrate as 10 g. of white bread. A great deal of calculation would be needed to prescribe an accurate diet from these data, much of which can be avoided by the use of tables such as modern English and American text-books on diabetes supply. There is in other chapters also a general tendency to enunciate the principles and to limit the practical application to giving lists of foods to be taken or avoided in the various disorders. The value of these lists would be increased greatly if they were more often supplemented by a detailed account of an actual day's food. The vitamins come in for little attention. Indeed, apart from a discussion of the classical deficiency diseases of scurvy, scurvy-rickets, and beri-beri, the author does not deal with them in detail. He speaks also with caution about the recently expressed view that calcium deficiency is a cause of diseases such as asthma, hay fever, and certain catarrhs.

This is a wise book, a little conservative perhaps, but full of sound experience and knowledge, and free entirely from the dogmatic empiricism which creeps so easily into works on diet.

THE NERVOUS CHILD.

Second edition. By HECTOR CHARLES CAMERON, M.A., M.D., F.R.C.P., Physician in Charge of the Children's Department, Guy's Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 224. 7*s.* 6*d.*

WE like to think that this little book, now appearing in a well-merited second edition, is a product of the English mind and the English spirit. It lies poles asunder from the dreary nastiness of some more ambitious productions emanating from other sources and ostensibly dealing with the mental life of the nervous child. Through its pages runs an illuminating ray of common-sense and medical wisdom which is no less pleasing than instructive. Our children are largely what we make them. In several passages Dr. Cameron rightly lays the emphasis, not on infantile or juvenile experiences per se, but on the attitude of parents and nurses to these. In showing their own apprehensions, and communicating them, they sap the confidence of the child. He declares in no unmeasured terms that for the treatment of childish neuroses psycho-analysis has dangers and produces ill-effects far outweighing any presumable advantages to be gained from it. Management rather than treatment is the keynote of many of his chapters, prevention rather than cure, nursery hygiene rather than specialists' consulting rooms. It is a book to place without reserve in the hand of intelligent parents, governesses, and nurses, no less than in that of the practitioner of medicine; its general tone of optimism is reassuring and cheering; its outlook is sane and healthful, its quiet humour comforting. The insight shown by Dr. Cameron into the mind of the child reveals the profound student of his subject.

DIE LUMBALPUNKTION.

Anatomie, Physiologie, Technik, Untersuchungsmethoden, diagnostische und therapeutische Verwertung. By Dr. MARTIN PAPPENHEIM, Privatdozent in the University of Vienna. Vienna: Rikola Verlag. 1923. Pp. 184.

IN the course of the last ten years a number of text-books dealing with the cerebro-spinal fluid have appeared, but since the subject is one to which research is constantly being devoted, finality has not been reached; new methods come into vogue, new discoveries are announced, new diagnostic procedures are elaborated, with embarrassing frequency. Dr. Martin Pappenheim's brochure represents the very latest advances in all that concerns the fluid. The work is stronger on the chemical than on the microscopical side; Chapter X., on qualitative cell-examination, might be amplified with advantage, and would in any case be improved by drawings of the cell types enumerated. This little book should be in the hands of every laboratory worker, and the clinician will appreciate its usefulness in spite of its admittedly technical character.

LEHRBUCH DER NERVENKRANKHEITEN.

By H. OPPENHEIM. Seventh edition, revised and enlarged, by R. CASSIRER, K. GOLDSTEIN, M. NONNE, and B. PFEIFER, in collaboration. Berlin: S. Karger. 1923. Vol. I. With 323 illustrations and 4 plates. Pp. 923. 27*s.*

GERMAN neurology suffered a grievous loss by the death of Hermann Oppenheim on May 23rd, 1919. It is no mere figure of speech to say that he left behind him a monument of enduring value in his classical text-book, which now appears in a seventh edition, revised and enlarged by four distinguished German neurological confrères. Dr. Cassirer undertook the responsibility of preparing this latest edition, though he says in his preface that with the passing of Oppenheim no single worker could supervise the whole of the field of neurology without help. Hence the collaboration already noted. Oppenheim's book is a treasure-store of neurological knowledge. Scanning its familiar pages again one does not know whether to admire most its comprehensiveness, the skill with which an overwhelming amount of detail is marshalled for assimilation, or the personal touch which runs like a thread through the whole. A cyclopædia of this kind is of permanent importance; it is the outcome of a love of scientific truth which oversteps all national and racial boundaries. We may hope that generations of neurological students who never knew Oppenheim in the flesh will keep his memory green by their appreciation of the best book on the subject that has ever been written.

THEORIES AND PROBLEMS OF CANCER.

By C. E. WALKER, Associate Professor of Cytology in the University of Liverpool. London: University of Liverpool Press and Hodder and Stoughton. 1923. Pp. 126. 5s.

IN this small book the author has brought up to date a series of articles written for Science Progress in 1912. It is addressed to the intelligent layman as well as the more professional public, but we fear that few of the former will be able to understand it, for Prof. Walker fails to realise the width of the gap in thought and terminology which separates him from his neighbour in tram or bus. For the latter it provides a rather gloomy review of those aspects of the cancer problem which have most interested the author. He writes as one wandering hither and thither in a dark forest, not as a happy and adventurous pilgrim who knows that the golden age is just round the corner. It is surely superfluous sadness to belittle the experimental study of transplantable tumours because it has not revealed the cause and cure of cancer and to neglect the great fundamental advances in our knowledge of its nature which have been achieved by this method by the Imperial Cancer Research Fund and others, and which, as far as can be imagined, could have been made by no other means. And it is a simple assumption to say that work in other directions would have been of far greater value. Plenty of people have worked at cancer in other directions and, to say the least, have found out no more. In detail we may note that the criticism (p. 88) of the view that too hot food and drink may cause cancer neglects the mechanism of swallowing as well as the very striking evidence from China connecting the excess of epitheliomas of the lower end of the œsophagus in males with the habit of the women waiting to eat till the men have finished. The statement (p. 52) that *all* the symptoms and damage done by malignant tumours are due to pressure or some other mechanical action on the surrounding parts is hardly in accord with clinical experience of cachexia.

The book contains much that is of interest, and though experienced workers may find but little stimulation in its pages, no thoughtful attempt to unravel such a tangled skein as the cancer problem should be disregarded, and we commend Prof. Walker's book to those who are engaged in working at cancer from whatever aspect.

JOURNALS.

BRITISH JOURNAL OF OPHTHALMOLOGY. June, 1923. R. Foster Moore: A Watertight Suture in Trephining. It is generally acknowledged that the localised cystic swelling sometimes seen after trephining is undesirable, and that the result to aim at is a more diffuse subconjunctival œdema, showing that the excess fluid from the globe has free drainage into the subconjunctival space. To obtain this desirable result Foster Moore completes his operation by carefully suturing the edges of his conjunctival incision, thus preventing the sealing down of the lateral parts of the conjunctival flap which takes place if the fluid is allowed from the first to find an exit through an unsutured conjunctival incision.—The late Charles Killick: Treatment of Conical Cornea. Finding the recognised methods of surgical treatment unsatisfactory, Killick has had recourse to a simple extraction of the lens with a subsequent needling operation to form a vertical slit in the capsule. By this means he succeeded in improving the vision of one patient from less than 6/60 to 6/24. As a conical cornea necessarily causes high myopia it is perhaps surprising that this procedure has not been tried before.—R. P. Ratnaker: Blue Cataract. The blue dots sometimes seen in the lens by focal illumination do not interfere with vision very much, and they seldom progress into a condition calling for operation. It therefore seems a pity to use the word cataract. The author suggests that some other word, less alarming to the patient, should be found for all non-progressive opacities of the lens.—C. H. Bryant: The Third Dimension in Monocular Vision. Stereoscopic vision is popularly supposed to be impossible with one eye. Bryant suggests that it is attained by the unconscious comparison of the image which falls in the [macula with the more or less blurred images of objects not in the direct line of vision, and this theory seems altogether probable. "An experimental proof of this is readily made by viewing the landscape through a series of opaque tubes of increasing calibre. In proportion as the field viewed is made more extensive and more objects are seen in it, so does the sense of depth become more evident."

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each the composition and the food value are stated. The author rightly asserts that for the dietetic treatment of constipation an exact diagnosis is of first importance. The causes are various; and loss of the power of expulsion is seldom one of them. The delay may be due to atony, to spasm, or to weakness of the abdominal walls, and may be complicated by stenosis, by mucous colitis, or by piles. We notice that the use of X rays to determine the actual nature and seat of the delay is not mentioned. For the spastic forms of constipation a diet calculated to render the motions soft, but poor in cellulose, is advised. It would contain little or no meat, abundance of fruit juices and jellies, honey, whey, buttermilk or sour milk, milk-sugar, lævulose, olive oil, paraffin or agar-agar. For the torpid forms of constipation the usual wholemeal bread, salads, and fruits are recommended. In mucous colitis the cellulose-poor anti-constipation diet is first tried, and later, if needed, a cellulose-rich diet as advocated by v. Noorden.

In speaking of diet in kidney disease Prof. Strauss lays stress on the fact that in many cases of nephritis there is no demonstrable impairment of renal function. There may be a harmless "anephritic" albuminuria. The quantity of albumin is not indeed of value as a guide to the severity of chronic nephritis; neither has diet such a definite influence upon it as was formerly supposed. He doubts also if small quantities of spices and condiments have any adverse effect on the kidney. The reader cannot fail to note Prof. Strauss's practical acquaintance with the phases and consequences of starvation. The copious details offer an arresting contrast to the pre-war literature of a few references to special fasting experiments. We may hope that Europe will see no more of hunger-osteopathy and hunger-œdema. In treating sub-nutrition exercise is valuable. Weak and very thin patients should begin their treatment in bed, but the muscles must be kept in condition by massage, faradisation, and exercises. In the chapter on diabetes the various methods of dieting are discussed in general terms, but few specific instructions, such as the doctor really needs, are given. The analyses of foods are stated in percentages as a rule, though there is one useful table which gives the weights of various foods containing the same quantity of carbohydrate as 10 g. of white bread. A great deal of calculation would be needed to prescribe an accurate diet from these data, much of which can be avoided by the use of tables such as modern English and American text-books on diabetes supply. There is in other chapters also a general tendency to enunciate the principles and to limit the practical application to giving lists of foods to be taken or avoided in the various disorders. The value of these lists would be increased greatly if they were more often supplemented by a detailed account of an actual day's food. The vitamins come in for little attention. Indeed, apart from a discussion of the classical deficiency diseases of scurvy, scurvy-rickets, and beri-beri, the author does not deal with them in detail. He speaks also with caution about the recently expressed view that calcium deficiency is a cause of diseases such as asthma, hay fever, and certain catarrhs.

This is a wise book, a little conservative perhaps, but full of sound experience and knowledge, and free entirely from the dogmatic empiricism which creeps so easily into works on diet.

THE NERVOUS CHILD.

Second edition. By HECTOR CHARLES CAMERON, M.A., M.D., F.R.C.P., Physician in Charge of the Children's Department, Guy's Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 224. 7*s.* 6*d.*

WE like to think that this little book, now appearing in a well-merited second edition, is a product of the English mind and the English spirit. It lies poles asunder from the dreary nastiness of some more ambitious productions emanating from other sources and ostensibly dealing with the mental life of the nervous child. Through its pages runs an illuminating ray of common-sense and medical wisdom which is no less pleasing than instructive. Our children are largely what we make them. In several passages Dr. Cameron rightly lays the emphasis, not on infantile or juvenile experiences per se, but on the attitude of parents and nurses to these. In showing their own apprehensions, and communicating them, they sap the confidence of the child. He declares in no unmeasured terms that for the treatment of childish neuroses psycho-analysis has dangers and produces ill-effects far outweighing any presumable advantages to be gained from it. Management rather than treatment is the keynote of many of his chapters, prevention rather than cure, nursery hygiene rather than specialists' consulting rooms. It is a book to place without reserve in the hand of intelligent parents, governesses, and nurses, no less than in that of the practitioner of medicine; its general tone of optimism is reassuring and cheering; its outlook is sane and healthful, its quiet humour comforting. The insight shown by Dr. Cameron into the mind of the child reveals the profound student of his subject.

DIE LUMBALPUNKTION.

Anatomie, Physiologie, Technik, Untersuchungsmethoden, diagnostische und therapeutische Verwertung. By Dr. MARTIN PAPPENHEIM, Privatdozent in the University of Vienna. Vienna: Rikola Verlag. 1923. Pp. 184.

IN the course of the last ten years a number of text-books dealing with the cerebro-spinal fluid have appeared, but since the subject is one to which research is constantly being devoted, finality has not been reached; new methods come into vogue, new discoveries are announced, new diagnostic procedures are elaborated, with embarrassing frequency. Dr. Martin Pappenheim's brochure represents the very latest advances in all that concerns the fluid. The work is stronger on the chemical than on the microscopical side; Chapter X., on qualitative cell-examination, might be amplified with advantage, and would in any case be improved by drawings of the cell types enumerated. This little book should be in the hands of every laboratory worker, and the clinician will appreciate its usefulness in spite of its admittedly technical character.

LEHRBUCH DER NERVENKRANKHEITEN.

By H. OPPENHEIM. Seventh edition, revised and enlarged, by R. CASSIRER, K. GOLDSTEIN, M. NONNE, and B. PFEIFER, in collaboration. *Berlin: S. Karger. 1923. Vol. I. With 323 illustrations and 4 plates. Pp.* 923. 27*s.*

GERMAN neurology suffered a grievous loss by the death of Hermann Oppenheim on May 23rd, 1919. It is no mere figure of speech to say that he left behind him a monument of enduring value in his classical text-book, which now appears in a seventh edition, revised and enlarged by four distinguished German neurological confrères. Dr. Cassirer undertook the responsibility of preparing this latest edition, though he says in his preface that with the passing of Oppenheim no single worker could supervise the whole of the field of neurology without help. Hence the collaboration already noted. Oppenheim's book is a treasure-store of neurological knowledge. Scanning its familiar pages again one does not know whether to admire most its comprehensiveness, the skill with which an overwhelming amount of detail is marshalled for assimilation, or the personal touch which runs like a thread through the whole. A cyclopædia of this kind is of permanent importance; it is the outcome of a love of scientific truth which oversteps all national and racial boundaries. We may hope that generations of neurological students who never knew Oppenheim in the flesh will keep his memory green by their appreciation of the best book on the subject that has ever been written.

THEORIES AND PROBLEMS OF CANCER.

By C. E. WALKER, Associate Professor of Cytology in the University of Liverpool. London: University of Liverpool Press and Hodder and Stoughton. 1923. Pp. 126. 5s.

IN this small book the author has brought up to date a series of articles written for Science Progress in 1912. It is addressed to the intelligent layman as well as the more professional public, but we fear that few of the former will be able to understand it, for Prof. Walker fails to realise the width of the gap in thought and terminology which separates him from his neighbour in tram or bus. For the latter it provides a rather gloomy review of those aspects of the cancer problem which have most interested the author. He writes as one wandering hither and thither in a dark forest, not as a happy and adventurous pilgrim who knows that the golden age is just round the corner. It is surely superfluous sadness to belittle the experimental study of transplantable tumours because it has not revealed the cause and cure of cancer and to neglect the great fundamental advances in our knowledge of its nature which have been achieved by this method by the Imperial Cancer Research Fund and others, and which, as far as can be imagined, could have been made by no other means. And it is a simple assumption to say that work in other directions would have been of far greater value. Plenty of people have worked at cancer in other directions and, to say the least, have found out no more. In detail we may note that the criticism (p. 88) of the view that too hot food and drink may cause cancer neglects the mechanism of swallowing as well as the very striking evidence from China connecting the excess of epitheliomas of the lower end of the œsophagus in males with the habit of the women waiting to eat till the men have finished. The statement (p. 52) that all the symptoms and damage done by malignant tumours are due to pressure or some other mechanical action on the surrounding parts is hardly in accord with clinical experience of cachexia.

The book contains much that is of interest, and though experienced workers may find but little stimulation in its pages, no thoughtful attempt to unravel such a tangled skein as the cancer problem should be disregarded, and we commend Prof. Walker's book to those who are engaged in working at cancer from whatever aspect.

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IN the annual report for 1922 of the *Glengall Hospital for Mental Diseases, Ayr,* the medical superintendent, Dr. G. Douglas McCrae, protests against the delay which occurs in committing patients to mental hospitals for treatment. Excluding congenital cases, 61 per cent. of the men and 48 per cent. of the women had exhibited symptoms of mental disease for more than a year before being sent to this hospital for treatment—in the case of one woman three years, in another 12 years, and in a third 20 years, had elapsed. Scarcely 9 per cent. of the men and only 16 per cent. of the women were admitted within three months of the onset of the mental illness. With regard to physical health, the proportion of cases seriously exhausted on admission was unusually high at 45 per cent. among the men and 50 per cent. among the women; this index of the hospital nature of the institution ought to appeal to all but the indifferent and unconvincible among the general public. Dr. McCrae regards some of the stereotyped predisposing causes of insanity with a respect which is tempered with some amusement. "Among the causes of the mental illness in those admitted, hereditary predisposition was acknowledged in 30 per cent., as usual. While it may be correct to affirm that no man can become insane unless he be constitutionally 'nervous,' who can truthfully assume, however confidently he may assert, that no case of mental disease has ever occurred among his ancestors? Not even the brain in the Piltdown skull could claim such immunity." "Notwithstanding that the incidence of alcohol is steadily decreasing, a high annual admission-rate is maintained. It is not alcohol that fills the asylums, but it does serve to indicate those who ought to be in the asylum, where the alcoholic degenerate is a *rara avis*, though a well-recognised species amongst the general community." A remarkable item in the statistics is the supply, from the gardens, of 1084¼ lb. of parsley in one year to an institution providing food for not more than 600 people.

The annual report for 1922 of the *Glasgow Royal Asylum* records the acquisition of two new buildings, one of which is being used as a nursing home for incipient cases, and one, which occupies an attractive position overlooking the Firth of Clyde, as a convalescent and holiday home for patients in the hospital. It is also hoped to build a new nurses' home in the near future. An original step has been taken in appointing an instructor in occupational therapy; this is said to be the first example of such an appointment in a hospital of this kind in Scotland. Among the subjects on which research work is in progress are the part played by focal infections in insanity, the blood-sugar content in states of depression associated with anxiety, and the effect of spinal drainage, reinforced by giving mercury and arsenic, in organic disease of the nervous system (exact particulars of this work are not given). The medical superintendent's report embraces a discussion of the part played by alcoholism in the production of insanity. "My general feeling is," writes Dr. D. K. Henderson, "that alcohol as a cause of mental disorder is of great importance, but very frequently also it is merely a symptom, and points the way to a more definite and profound underlying cause. Under these circumstances I think that purely prohibitive measures will never succeed, because the question is not so simple as to be dealt with in such a crude way." The only satisfactory solution, he concludes, is to attempt to produce better conditions of life, and to study the individual and environmental conditions which are at the bottom of this habit disorder.

TWO PRIVATE MENTAL HOSPITALS.

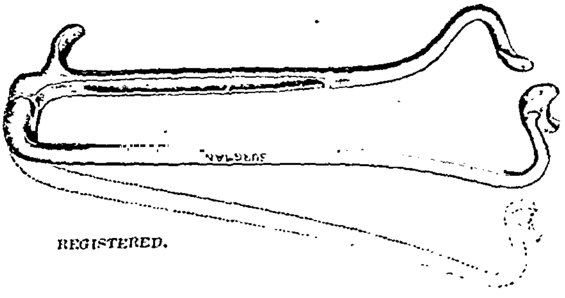
In the annual report of *The Retreat, York,* Dr. Henry Yellowlees, who has succeeded Dr. Bedford Pierce as medical superintendent, maintains a tradition common to several such institutions in contributing a long and very readable superintendent's report, dealing with a number of questions of general interest. Similar points are raised by Dr. Arthur Townsend in the annual report of *Barnwood House, Gloucester.* A remarkable feature of the year's work at The Retreat was the high proportion of voluntary boarders admitted, no less than 46 per cent. of the total number of patients. The proportion at Barnwood House was much smaller, and Dr. Townsend deplores the difficulty of widening the scope of the voluntary status. He cites the example of a voluntary boarder whose condition for the time being became such that, by the present standards, certification was inevitable. Within a fortnight she was well. The problem of providing occupation for the patients is another subject which is engaging the attention of the authorities at both of these hospitals. Games and gardening have always figured largely at The Retreat, and a new social venture is represented in "Harbour Lights," a magazine edited and very largely written by the patients. There is room, however, for more work of a different nature, the whole being systematised under the control of an officer whose time is devoted solely to this purpose. This is the end in view in each case, and Dr. Townsend suggests the possibility of "classes of instruction" in various arts and handicrafts.

At Barnwood House there is some prospect that the nurses may be engaged under stricter form of agreement. In spite of good conditions and relatively high payment, a number have been leaving before their course of instruction has been completed. It is desirable that mental nursing as a career should be brought more generally to the notice of the public; the difficulty experienced in staffing mental hospitals is due chiefly to ignorance, either of the nature of work, or of its mere existence as a career. "It seems strange that while so much is done for the nursing of the sick, so few should be willing to devote themselves to the care of the insane, which is the highest and most difficult of all nursing. . . . To do it well requires high qualities of head and heart; and there can be no better or worthier sphere for those whose desire it is not merely to gain a living, but to be at the same time 'continually doing good.'" This quotation, reproduced by Dr. Yellowlees, is from an annual report for 1875. In his words "it is even more fully true to-day than when it was written almost 50 years ago."

New Inventions.

A MANDIBLE RETRACTOR.

THE accompanying illustration shows an instrument devised during the war for pulling the mandible forward under an anæsthetic. This retractor has proved to be of value during anæsthesia under conditions of impeded respiration, and where it is necessary to advance the mandible. In the first instance the instrument was devised for cases in which the mandible had been fractured and originally it was made from iron wire. It has now been in use for some years, and has proved so useful that others may be glad to avail themselves of the pattern made from it by the Surgical Manufacturing Co., Ltd., Mortimer-street, London, W. 1.



London, W. W. WARWICK JAMES, F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, JULY 14, 1923.

SMALL-POX AND VACCINATION.

We printed in the last issue of The Lancet the official figures giving the notifications of small-pox for the preceding week in England and Wales; those of the following week, bringing the account up to June 30th, have now been published, and are quoted in a statement with regard to the small-pox situation which has been issued from the Ministry of Health and appears on p. 92. This statement dwells in the first instance on the failure at Gloucester to control the disease when control would have been easy. There were cases of small-pox in the city as far back as April, and official warning was received from the Ministry of Health by the sanitary authority early in May that in other cases occurring in distant localities the source of infection had been traced to Gloucester; but notification by local practitioners was refused by the medical officer of health, in the view, presumably, that the diagnosis was in error. The question as to whether the disease was in fact small-pox was finally settled by expert advice, both official and other, when the local authority was immediately assisted, under the superintendence of Dr. W. H. Davison, senior assistant to the medical officer of health at Birmingham, to set up a special hospital and special vaccinating stations, to trace contacts, and to do everything possible to stamp out the infection locally, and to prevent its further spread.

The statement from the Ministry of Health, which includes figures proving that the incidence of small-pox is at present widely spread in the country, is uncompromising in its recommendation of vaccination as the only practical remedy now that the infection has been introduced. No one denies that the decline of small-pox, as of most epidemic diseases, is influenced by a rise in the standard of the sanitary conditions and the economic opportunities of the population, but no serious student of epidemiology can doubt that in vaccination we have a practical method of controlling further spread of this disease when an outbreak has occurred. The value of universal compulsory vaccination and revaccination would be well worth discussing in the light of all the information now available and outside the murky atmosphere of dialectics. For the moment it is happily an academic question for the greater part of the country, and even admitting that the influence of vaccination is neither individually infallible nor permanent, this need not impart a hesitating quality into our advocacy of the procedure in face of a local outbreak of disease. The outcome of the frank views of the Ministry of Health is believed in some quarters to be the prelude to amendment in the law, but Mr. Neville Chamberlain has expressed his belief that no special legislation is necessary.

OPERATIONS FOR DISEASE OF THE GALL-BLADDER.

The surgery of the biliary tract is passing through the stages which have characterised the evolution of surgery of other abdominal organs. The perfecting of technique by specialist operators has shown the general practitioner how, in case of need, intervention in gall-stone disease may be undertaken with a moderate assurance of an immediate happy outcome. The result is that, rather prematurely perhaps, this branch of surgery is being practised by a large number of men, before knowledge has become sufficiently exact to indicate in all cases the proper course to follow. It is pertinent, too, to remember that the available and reliable statistics are those of the most experienced surgeons who, in their writings, characteristically fail to lay stress upon that perfection of technique which has done so much to furthering their favourable results. For these operators, biliary surgery has passed beyond the stage of developing a technique of intervention to that of deciding what procedure will best meet the existing pathological and physiological processes at work in each particular patient, so that, amongst them, controversy centres round the advisability of cholecystectomy or cholecystostomy, when gall-stones exist without complications. There seems to be a growing conviction amongst operators of experience, not only in this country, that the end-results of cholecystectomy are very much better than those of the simpler cholecystostomy. At a recent meeting of the Royal Society of Medicine, where the surgery of the common bile-duct was under discussion, Mr. James Sherren emphatically declared that "when the correct treatment for disease of the gall-bladder is carried out," meaning cholecystectomy, "we shall cease to have to discuss and carry out operations for the removal of duct calculi." In other words, his experience has led him to the conclusion that the recognition of early cholecystitis should be followed by removal of the gall-bladder.

Cholecystectomy is, indeed, being very widely practised just now. It must be accepted as a fact that a large percentage of favourable results ensue when they are vouched for by the leaders of gall-bladder surgery, but it is relevant to ask whether we have not travelled too far in this direction; whether, with a more careful selection, certain gall-bladders which are now sacrificed might not be preserved to play their part in the physiological economy of the individual. The fact that patients from whom the gall-bladder has been removed show few signs of being different from normal people, demonstrates no more than the marvellous powers of adaptation the body possesses, for there is abundant evidence that the organ has very important functions to perform. After the gall-bladder has been removed, either there is a varying but constant flow of bile *into* the duodenum, or, should the sphincter of Oddi remain continent, a dilatation of the bile-ducts behind it, in order to accommodate the dilute bile which is no longer reduced to one-tenth of its volume by gall-bladder activity. In either case the physiology of digestion is disturbed. Achylia occurs in 47 *per cent.* of cases of gall-stones.[1] In dogs cholecystectomy gives rise to achylia. It has also been found associated with a stone impacted in the cystic duct, which suggests that it is due to loss of gall-bladder function. Some observers, on the other hand, have demonstrated that in man the gastric juice may show normal acidity after removal of the

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[1] Rydgaarde: Arch. f. Klin. Chir., 1921, cxv., No. 3.

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TWO SCOTTISH HOSPITALS.

IN the annual report for 1922 of the *Glengall Hospital for Mental Diseases, Ayr*, the medical superintendent, Dr. G. Douglas McCrae, protests against the delay which occurs in committing patients to mental hospitals for treatment. Excluding congenital cases, 61 per cent. of the men and 48 per cent. of the women had exhibited symptoms of mental disease for more than a year before being sent to this hospital for treatment—in the case of one woman three years, in another 12 years, and in a third 20 years, had elapsed. Scarcely 9 per cent. of the men and only 16 per cent. of the women were admitted within three months of the onset of the mental illness. With regard to physical health, the proportion of cases seriously exhausted on admission was unusually high at 45 per cent. among the men and 50 per cent. among the women; this index of the hospital nature of the institution ought to appeal to all but the indifferent and unconvincible among the general public. Dr. McCrae regards some of the stereotyped predisposing causes of insanity with a respect which is tempered with some amusement. "Among the causes of the mental illness in those admitted, hereditary predisposition was acknowledged in 30 per cent., as usual. While it may be correct to affirm that no man can become insane unless he be constitutionally 'nervous,' who can truthfully assume, however confidently he may assert, that no case of mental disease has ever occurred among his ancestors? Not even the brain in the Piltdown skull could claim such immunity." "Notwithstanding that the incidence of alcohol is steadily decreasing, a high annual admission-rate is maintained. It is not alcohol that fills the asylums, but it does serve to indicate those who ought to be in the asylum, where the alcoholic degenerate is a *rara avis*, though a well-recognised species amongst the general community." A remarkable item in the statistics is the supply, from the gardens, of 1084½ lb. of parsley in one year to an institution providing food for not more than 600 people.

The annual report for 1922 of the *Glasgow Royal Asylum* records the acquisition of two new buildings, one of which is being used as a nursing home for incipient cases, and one, which occupies an attractive position overlooking the Firth of Clyde, as a convalescent and holiday home for patients in the hospital. It is also hoped to build a new nurses' home in the near future. An original step has been taken in appointing an instructor in occupational therapy; this is said to be the first example of such an appointment in a hospital of this kind in Scotland. Among the subjects on which research work is in progress are the part played by focal infections in insanity, the blood-sugar content in states of depression associated with anxiety, and the effect of spinal drainage, reinforced by giving mercury and arsenic, in organic disease of the nervous system (exact particulars of this work are not given). The medical superintendent's report embraces a discussion of the part played by alcoholism in the production of insanity. "My general feeling is," writes Dr. D. K. Henderson, "that alcohol as a cause of mental disorder is of great importance, but very frequently also it is merely a symptom, and points the way to a more definite and profound underlying cause. Under these circumstances I think that purely prohibitive measures will never succeed, because the question is not so simple as to be dealt with in such a crude way." The only satisfactory solution, he concludes, is to attempt to produce better conditions of life, and to study the individual and environmental conditions which are at the bottom of this habit disorder.

TWO PRIVATE MENTAL HOSPITALS.

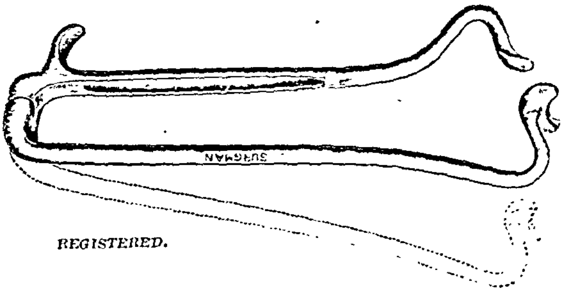
In the annual report of *The Retreat, York*, Dr. Henry Yellowlees, who has succeeded Dr. Bedford Pierce as medical superintendent, maintains a tradition common to several such institutions in contributing a long and very readable superintendent's report, dealing with a number of questions of general interest. Similar points are raised by Dr. Arthur Townsend in the annual report of *Barnwood House, Gloucester*. A remarkable feature of the year's work at The Retreat was the high proportion of voluntary boarders admitted, no less than 46 per cent. of the total number of patients. The proportion at Barnwood House was much smaller, and Dr. Townsend deplores the difficulty of widening the scope of the voluntary status. He cites the example of a voluntary boarder whose condition for the time being became such that, by the present standards, certification was inevitable. Within a fortnight she was well. The problem of providing occupation for the patients is another subject which is engaging the attention of the authorities at both of these hospitals. Games and gardening have always figured largely at The Retreat, and a new social venture is represented in "Harbour Lights," a magazine edited and very largely written by the patients. There is room, however, for more work of a different nature, the whole being systematised under the control of an officer whose time is devoted solely to this purpose. This is the end in view in each case, and Dr. Townsend suggests the possibility of "classes of instruction" in various arts and handicrafts.

At Barnwood House there is some prospect that the nurses may be engaged under stricter form of agreement. In spite of good conditions and relatively high payment, a number have been leaving before their course of instruction has been completed. It is desirable that mental nursing as a career should be brought more generally to the notice of the public; the difficulty experienced in staffing mental hospitals is due chiefly to ignorance, either of the nature of work, or of its mere existence as a career. "It seems strange that while so much is done for the nursing of the sick, so few should be willing to devote themselves to the care of the insane, which is the highest and most difficult of all nursing. . . . To do it well requires high qualities of head and heart; and there can be no better or worthier sphere for those whose desire it is not merely to gain a living, but to be at the same time 'continually doing good.'" This quotation, reproduced by Dr. Yellowlees, is from an annual report for 1875. In his words "it is even more fully true to-day than when it was written almost 50 years ago."

New Inventions.

A MANDIBLE RETRACTOR.

THE accompanying illustration shows an instrument devised during the war for pulling the mandible forward under an anæsthetic. This retractor has proved to be of value during anæsthesia under conditions of impeded respiration, and where it is necessary to advance the mandible. In the first instance the instrument was devised for cases in which the mandible had been fractured and originally it was made from iron wire. It has now been in use for some years, and has proved so useful that others may be glad to avail themselves of the pattern made from it by the Surgical Manufacturing Co., Ltd., Mortimer-street, London, W. 1.



London, W. W. WARWICK JAMES, F.R.C.S. Eng.

questions of fact which matter to the practitioner in an inquiry under Part VI. No doubt when the procedure of an inquiry under the National Health Insurance Acts was being assimilated to the procedure of arbitration under the 1887 Act, the object constantly before the minds of those who were devising procedure was that of getting decisions of fact without going to court. Neither Parliament nor the judicial bench are likely to encourage the re-trial of matters of fact already decided by some other tribunal. It is one thing to keep a lay tribunal straight on points of law, it is quite another thing to interfere with it on points of fact.

REWARD FOR MEDICAL DISCOVERY.

THE propriety of monetary recompense for scientific discoveries has been talked and written about for years without any clear outcome. The real issue is the difficulty of reconciling the two aspects, economical and ethical, of the problem. These two considerations are often in sharp and unexpected conflict, while both must be taken into account. Accepting the position outlined in a recent discussion on Prof. DREYER'S work, that even the most startling discovery in modern medicine can be no more than a link in a chain already forged, the element of chance in any individual piece of work proving to be that link is very large. When fame alone is to be the reward, merit is difficult enough to assess; if it be known that fortune also is at stake, heartburnings, struggles, and even those personal vituperations which have, to the honour of medicine, declined so greatly of recent years, may reappear. Even if the general principle is conceded that on ethical grounds that which proves of public service should be rewarded, the solution of the problem is not complete. Should the reward be a free gift, or should it be that form of gratitude which has an eye on favours still to come? We announced last week that the Canadian Parliament had unanimously voted an annuity of $7500 (£1500) to Dr. BANTING, the discoverer of insulin, to enable him to carry on his scientific work—or, as one lay paper phrased it, "to devote his life to medical research." It is the interpretation to be placed on this intriguing phrase, quite independent of its immediate context or of the personal problems of the present most worthy recipient, that we propose to investigate.

It is difficult to believe that this example of the Canadian Government will not be followed, and it therefore appears important to arrive at definite principles which govern such rewards, for they mark a distinct stage in the stimulation and encouragement of medical research. It should be settled first of all whether such grants are to be additional to any salary which the recipient would enjoy in the ordinary course of events. If not, they really represent institutional or university subsidies, and the way becomes open for intrigues among corporate bodies, with possible injustice to individuals; if, on the other hand, they are additional, then steps must be taken to ensure against the possible economic injustices inherent in subsidised labour. Again, are the grants to be given for actual or potential achievements? If for actual achievements, as already indicated great difficulties would seem to emerge. The placing of the coping-stone may be the least difficult part of the erection of a building, and how shall adjudication be made among the many labourers who have contributed to the whole? It must be remembered that the greatest discoveries may fail to receive contemporary recognition. Second-rate work is always more easily recognised by the majority, who themselves are and must be second-rate, and scarcely capable of recognising and immediately appreciating the enduring first-rate. Thus either injustice may be done or a reward may be delayed till it is no longer of use. If, on the other hand, grants are given for potential achievements, what provision will be made to ensure that the worker has facilities for carrying out his work? The ablest men are not always the most congenial colleagues, and we can conceive of a situation arising in which the recipient of such a reward may find it difficult to secure facilities. It must be remembered, also, that while few men achieve one great thing in life, far fewer achieve more than one. Is the recipient to have perfect freedom to elaborate for the rest of his life the details of his discovery—supposing that the same individual is temperamentally capable of such different forms of labour, or must he be for ever striving to produce a second discovery—a dangerous practice, for this way lie prematurity and disillusionment. May he forsake, for example, laboratory work and take up clinical practice, or is he to be tied to the one or the other? To the best type of man more than purely nominal control must be undignified and degrading, yet will nations or public bodies be prepared to support a worker indefinitely, without the periodical report or blue-book? Are they prepared to recognise that having chosen their man they must for ever after trust him and hold their peace, when the first flush of enthusiasm over his initial discovery has faded? The inevitable conclusion is that they must, if the tribute is not to be a yoke rather than a wreath.

To return to the particular instance which inspired this consideration of the broad issues involved, we may regard the rider appended by the Canadian Government to their gift as no more than a graceful recognition of the manner in which the man they have honoured will choose to live his life. This is in substantial accordance with the views of the joint committee representing the British Medical Association and the British Science Guild, whose report on the need for rewards for medical discovery was published in THE LANCET of Jan. 10th, 1920. Their proposals were: (1) That Parliament should resuscitate the precedent of JENNER by paying *compensation* when due for losses incurred in achieving medical discoveries; (2) that Parliament should provide an annual sum, say of not less than £20,000, for life pensions to be given as rewards to such of His Majesty's subjects as have made worthy medical discoveries, such pensions amounting to between £500 and £1000 a year. The Committee add that such pensions would be preferable to donations in capital, and the sums suggested would be sufficient, because men of science seek only such independence as will enable them to employ their talents in the manner they think best. The difficulties which we have set out above were appreciated by Earl BALFOUR, who as Lord President of the Council, received a deputation from the Medical Committee of the House of Commons in support of these recommendations. He received the proposals sympathetically, but held that a better plan would be to place investigators in a more comfortable position for carrying out their research work.[1] The two schemes are not incompatible, and indeed every important discovery made has a secondary value in enhancing the prestige and the claims for a living wage of those engaged in disentangling the intricate problems of medical science.

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[1] THE LANCET, 1920, i., 570.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

gall-bladder. How can these results be explained? Very possibly they depend upon the behaviour of the sphincter of Oddi, which cannot be predicted. If it remains functional, so that the flow of bile into the intestine is intermittent, then gastric secretion may take place as usual, but should a continuous flow of bile occur, then secretion of the pancreatic and gastric juices is much diminished. The digestive disturbances after cholecystectomy, which are familiar to surgeons of experience and recognised as occurring in a certain proportion of cases, are probably due much more to these causes than to the adhesions which are blamed, but are often not found on re-exploration. If the sphincter of Oddi remains continent after cholecystectomy, the greatly increased pressure against which the liver has to secrete leads to dilatation of the common and intrahepatic ducts, and must surely be disadvantageous to this organ in the long run, just as the kidneys cannot indefinitely secrete against pressure without harm coming to them. When it is remembered that the liver is the largest gland in the body, that it is the great metabolic laboratory of the organism, this consideration cannot lightly be set aside.

A powerful argument in favour of cholecystectomy is the view that the gall-bladder is the place of origin of the majority of gall-stones. Doubt has been thrown upon this belief by Aufrecht,[2] who states that in atrophic cirrhosis, in the neighbourhood of carcinomatous nodules, and when damming back of bile has occurred during pregnancy, liver-sand is often found in the smaller bile-ducts. The relief of pressure at parturition allows a free flow of bile again, and the discharge of the sand down the ducts is the cause of the biliary colic seen after child-birth. This observer believes that gall-stones arise in the liver and grow in the gall-bladder, so that the removal of the gall-bladder does not necessarily mean the extinction of the focus of origin of gall-stones. E. A. Graham[3] established the constant association of hepatitis with cholecystitis, and the work of M. G. Peterman[4] has demonstrated what the connexion is. He found that if streptococci were injected into the portal vein they could be detected in the wall of the gall-bladder and in the substance of the liver, although the cystic duct and artery had been previously ligated, and that they only appeared in the gall-bladder wall subsequently to their appearance in the liver. Infection took place by connecting lymphatics. It is true also that in early cholecystitis the outer layers of the wall of the gall-bladder are more affected than the mucosa. It therefore seems to follow that the origin of cholecystitis is really in the liver substance. This does not mean that cholecystectomy is a fundamentally wrong operation. It may quite well be that infection in the liver tends towards cure of itself, whilst restitution of the gall-bladder walls to normal is difficult of achievement.

In the light of such recent work, the after-history of patients who have been submitted to cholecystectomy requires careful reinvestigation, with a view to making a true comparison with patients submitted to cholecystostomy, where the gall-bladder appeared at operation to be capable of recovery. Although the mortality of cholecystectomy has been much reduced by modern methods, it remains a more serious operation than cholecystostomy, so that an attempt to restrict its field of application is desirable. To remove a gall-bladder is a confession of failure to attain the ideals of surgery in this region of the body—namely, a restoration to normal function, although it seems from present available evidence to be unusually effective in bringing relief to a large proportion of sufferers.

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THE PRACTITIONER'S RIGHT OF APPEAL.

Last month we received from the Welsh Board of Health a formal notice that after an inquiry, held in accordance with Part VI. of the Medical Benefit Consolidated Regulations for 1923, the name of a qualified and registered practitioner had been removed from the medical list for the county of Glamorgan. Similar notices reach us from time to time from the Ministry of Health. Four years ago, at one of the annual conferences of local medical and panel committees a resolution was passed to the effect that no medical practitioner should be deprived of the right to continue in insurance practice without the liberty of appeal to an independent judicial administrative body or court other than H.M. Insurance Commissioners or the Ministry of Health. Dr. J. H. Clements, who recalls this resolution in our correspondence columns, regards the negotiating body as having been lax in allowing the new agreement for service to go through without establishing this principle of the right of appeal or, as he himself would perhaps more vigorously put it—though this issue is a secondary one for our present purpose—as having claimed the victory whereas they had sold the pass.

The complete facts are not very easy to come by, but the position apparently is, that there is no appeal to the law courts for a practitioner whose name is being taken off the list as a result of such an inquiry as we have alluded to, although under Section 7 of the Nurses Registration Act of 1919 a nurse threatened with having her name removed from the Nursing Register may appeal to the High Court; under Section 9 of the Dentists Act of 1921 a dentist has a similar right of appeal, and under Section 4 of the Midwives Act of 1902 a midwife also has the corresponding right. Why the same facility of appeal was not laid down in the National Health Insurance Acts is not quite clear, although obviously removal from the panel is not so serious a disability as removal from the Register, to which appeal refers in the case of nurses, dentists, and midwives. The Medical Benefit Consolidated Regulations of 1923 make it clear that the panel practitioner has no right to have a special case stated on questions of law arising out of inquiries under Part VI. Part V. of these Regulations, which contains the provisions relating to disputes, appeals, and so forth, does indeed apply (Art. 35) certain scheduled sections of the Arbitration Act, 1889, to "any appeal made to the Minister under these Regulations against a decision of a Committee," and Section 19 of the Regulations runs: "The Minister may at any stage of the proceedings on an appeal, and shall, if so directed by the Court or Judge, state in the form of a special case for the opinion of the Court any question of law arising in the course of the appeal." But this Section 19 was omitted from the 1920 Regulations and is still omitted in 1923, just as in 1920, with the result that there is no right of appeal for a practitioner whose continuance on the list has been made the subject of an inquiry under Part VI. The omission does not trouble the great majority of practitioners who would prefer to go before a tribunal of three, two of whom are doctors, than to go before any other tribunal, judicial or otherwise. In any case Section 19 of the Arbitration Act contemplates appeal only on questions of law, not on questions of fact, and it is

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[2] Deutsch. Archiv f. Klin. Med., 1919, cxxviii., 242.
[3] Surg., Gyn., and Obstet., 1918, xxvi., 521.
[4] Surg., Gyn., and Obstet., 1923, xxvi., 522.

A complete account of fractional antigens is given in a series of articles by Much and Leschke.[7] These workers divide their antigens into three groups. 1. Tuberkelbazilleneiweiss, named Tb. A. The bacilli were defatted by prolonged extraction with benzoyl chloride. There was no preliminary acid treatment, this being hardly necessary when it is remembered that a fair quantity of hydrochloric acid would be set free during the extraction process. 2. Fettsäuren und lipoide tuberkelbazillen, containing the lipoid and fat content. 3. Tuberculonastin, an alcohol and ether extract of the above. Tested as antigens by the complement-fixation test on various known sera, it was found that where Koch's B.E. gave positive results in 77·1 per cent. tuberculonastin gave only 56·2 per cent. of positives, the fatty-acid antigen 14·3 per cent., whilst the defatted antigen gave only 7·1 per cent. of positives. These three antigens were used by Much and Leschke for therapeutic purposes, although they refrain from stating how the results compare with Koch's antigens. In his book, "Die Immunitätswissenschaft," Much[8] quotes his work with Deycke on defatted and other antigens at great length. It is curious that here again no statement is made as to the relative values of these various antigens as compared with Koch's preparations. Judging from complement fixation, defatted antigen appears inferior to ordinary B.E. Prof. Dreyer is working with an antigen defatted in a very similar manner to the Tb. A. of Much and Deycke, and it is on the clinical and experimental results that interest will centre.

SUPERFICIAL SENSIBILITY.

IT is more than probable that the skin and touch have been associated in the mind of man from the time when he first analysed his feelings. The ancient philosophers dealt with the special senses according to their particular theories, and among these Democritus may be mentioned as upholding the opinion that all the senses were but modifications of that of touch. Aristotle held quite opposite views, and to him the skin was a necessary adjunct to the organ of touch, for certain philosophical reasons, but was not that organ itself, in the sense in which the eye and ear might be termed the special organs of sight and hearing. Galen subsequently made the distinction more definite, in that he seemed to lay more stress on the covering than on the tactile functions of the skin. It was, however, described later by Constantinus as the organ of touch, tactile sensibility varying in different places. After this we find Casserius, in the seventeenth century, going back to the opinion of Democritus concerning the essential unity of the senses, but he referred differentiation between them to the "sensitive faculty" in the brain: among the ancients this faculty lay in the proper organs of the senses, quite apart from the brain. Malpighi now described tactile papillæ in the skin, and referred tactile impressions to these, considering them to be formed by ends of nerves. Molinetti shared with Democritus and Casserius the view that all sensations are modifications of touch-sense, but with him the differentiation had to do with variation in number and arrangement of nerves, an opinion supported by Buffon in more recent times with much ingenuity. Thus there has been a slow progress in clarification of view about touch, a correction of opinion about functions of sense-organs, increasing appreciation of the rôle of the nervous system, search for anatomical bases for opinions, and analysis of the senses themselves. To-day we find the progress still going on, and the analysis becoming more critical. Head, by his researches and by the classical experiment on his own arm, led us some years ago to distinguish between deep and superficial sensibility, and gave reasons for subdividing this last into two classes. Prof. J. S. B. Stopford, who has done much sound and philosophical work in the last few years on wounded nerves, has proposed recently that deep sensibility should also be divided into classes corresponding with those of cutaneous sense. Prof. Stopford has added much to our knowledge of nerve distribution in the upper limb, and has described fibres to the deeper layers from nerves usually considered purely sensory, thus giving a structural basis for certain of his conclusions. He suggests[1] thalamic and cortical terminations for tracts subserving protopathic and epicritic sensation respectively. Evidently anatomico-physiological analysis of touch-sense is progressing satisfactorily, but the end of it is not yet.

THE NEW B.P. CODEX.

A NEW and revised edition of the British Pharmaceutical Codex has just been issued by the Pharmaceutical Press (72, Great Russell-street, London, W.C.), by direction of the Council of the Pharmaceutical Society of Great Britain. This is the third edition since 1907 when the Codex first appeared. The scope of it was then defined as an imperial dispensatory for the use of medical practitioners and pharmacists, containing information respecting all drugs and medicines in common use throughout the British Empire, including the principal substances and preparations which are official in the pharmacopœias of France, Germany, and the United States, as well as those described in the British Pharmacopœia. The original work contained in the volume represents the fruits of arduous labour and extensive investigations, partly performed in the research laboratory of the Pharmaceutical Society, but a large proportion privately undertaken by individual members of that Society. The present edition contains much new matter and has been brought into line with the British Pharmacopœia of 1914 and the ninth revision of the U.S. Pharmacopœia. While the genera plan of the work has been left unaltered, the chemical nomenclature has been brought into line with modern views and the physiological action of important substances has been extended in accordance with the latest development of medical research. Doses are now set out in metric units with a parenthetic alternative in grains and minims. The extent of time-saving to which a general adoption of the metric system would give rise is apparent in a table giving the percentage equivalents of grains (minims) in pint, pound, and ounce. The index is a marvel of completeness and the Codex, 1923, forms a work of reference of great value and accuracy.

FURTHER DISCUSSIONS ON THE DIET OF THE WEANLING.

NOT much more than two years ago the Society of Medical Officers of Welfare Centres, now incorporated as a group of the Society of Medical Officers of Health, discussed at some length the choice of a diet for a child from weaning to the age of 5 years. The meeting was fully reported in our columns and our comments thereon led to some lively correspondence. It appeared that the subject was to be further developed, for among the items in the programme issued of the proposed activities of the *Conference* on Infant Welfare held during Baby Week at 117, Piccadilly, London, W. 1, was a discussion by this group on the Feeding of Children from 5 Years of Age, to be opened by Prof. E. Mellanby. This would appear to us a subject of interest to practitioners as well as to parents and to the elementary schools providing dinners to infant classes, though presumably designed for the information of medical officers of infant welfare centres, giving parting instructions on dismissing the child to parental care. Owing partly to an apparent misprint in the programme and to some extent to the absence of Prof. Mellanby, the debate was less illuminating than might have been expected. It dealt with the feeding of children, not after 5 years old, but from 1 to 5, and it will be seen by our report

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[7] Much and Leschke: Beitr. klin. Tuberk., 1911, xx., 341, 351, 405.

[8] Much: Die Immunitätswissenschaft, 1911, pp. 230–261.

[1] Brain, iii. and iv., 1922. Also Jour. Anat., 1918, 1921, 1923.

Annotations.

"Ne quid nimis."

THE CENTENARY OF THE LANCET.

THE dinner in celebration of the completion of the hundredth year of THE LANCET will be held in London on Wednesday, Nov. 28th, 1923. Sir Donald MacAlister, President of the General Medical Council, will take the chair, supported by the President of the Royal Society, the President of the Royal College of Physicians of London, the President of the Royal College of Surgeons of England, the Chief Medical Officer of the Ministry of Health, the President of the Royal Society of Medicine, and the President of the Medical Society of London. Dr. J. H. W. Laing and Mr. H. D. Gillies (7, Portland-place, London, W.) are acting as Honorary Secretaries to the Dinner Committee.

THE INFECTING AGENT OF EXANTHEMATIC TYPHUS.

Prof. W. Barykin and Dr. N. Kritsch, of Moscow, have announced[1] the discovery of what they claim to be "with very great probability" the cause of exanthematic typhus. Prof. Barykin has for four years been investigating typhus. He early found that the typhus process so altered the blood-vessels as to facilitate infection of the blood-stream with myriad micro-organisms, all of whom the blood of typhus cases agglutinated. It was in consequence of these very various infections that complications were so frequent, occurring as they do in 30 or even 60 per cent. of the cases. Secondary infections being so frequent, he concluded the true cause could only be discovered in the body in the early days of the disease, in the pre-eruptive stage, and that he could hope for no help from agglutination reactions. So he investigated 23 cases of pre-eruption typhus, finding nothing then in the blood but some small elements ($0{\cdot}4$–$1{\cdot}5\mu$), closely resembling *Rickettsia prowazeki* ($0{\cdot}64\mu$) or young forms of Plotz's bacillus ($0{\cdot}9$–$1{\cdot}9\mu$); to these he gave the name *Microbion typhi exanthematici*. He and Afanassieff proceeded then to seek for it in 150 cases of human typhus, in 200 typhus-inoculated guinea-pigs, and in specimens from 11 early post-mortem examinations. They found that in the early days of the stage of invasion the bacterium (there seems no occasion for the term microbion) is so constantly present in the blood of the guinea-pig that, by its presence or absence, diagnosis can be definitely made even in the pre-eruptive stage, but the search may last for hours, and many films may have to be examined. It was in the blood that the bacterium was first found, but it occurs in far greater numbers in the cells of the brain, the spleen, and the suprarenals, growing within the cells into clusters, and in time killing the cells. The bacterium is not discoverable during the stage of incubation, and it could not be found in the organs of a hundred uninfected guinea-pigs and men. The investigation next concerned itself with lice; the bacterium was found in the intestinal epithelium and intestinal contents of 1050 of 1500 infected lice; it could not be found in lice from uninfected men. Further, in the intestinal contents of 280 infected lice, the bacterium was found in 192; it was found in the epithelium in 14 of the infected, in only one of the controls. It was difficult to make cultures of the bacterium until Kritsch hit upon the idea of making a medium out of the tissues in which the "microbion" is, customarily, most plentifully found. A pancreatised sterile broth being prepared, small portions of brain or spleen were rapidly removed under aseptic precautions, at early post-mortems of men or guinea-pigs dead in the first stage of the disease; these portions were minced very finely, mixed with the broth, and tubed. The tubes were over-layered with paraffin and incubated at 37° C. During the first ten days, the bacteria which had at first appeared, had gradually died out, and then the "microbion" might appear; it begins to grow in the tissue cells, only later spreading to the fluid. It begins as clusters of Gram-negative cocci, very small; later they increase in size and begin to stain with Gram. It is non-motile. At 37° C. they remain alive for 4–6 weeks, but die in an hour at 50° C.; once established it can be grown on pancreatised spleen- or brain-broth agar, on which it grows, aerobically, in round, glistening colonies. The growth is difficult to emulsify in normal saline; it will not grow in broth. Lastly, of 22 guinea-pigs inoculated with these cultures, 14 became infected; their disease, clinically, closely resembled typhus; few of them died, but in the ten that were killed at the close of the pyrexial stage there were found—hyperæmia of the spleen follicles with hyperplasia, hyperæmia of the suprarenals, hyperæmia and œdema of the brain; in other words, the histo-pathology of the infection produced by the bacterium in the guinea-pig is identical with that originated by typhus in man. On the strength of these observations Prof. Barykin and Dr. Kritsch make the claim that the bacterium is "very probably" the cause of typhus fever. We call attention to their interesting and suggestive observations. In spite of all the work which has been done upon it, the *Rickettsia* is not yet firmly habilitated as the cause of typhus. That the blood in typhus patients is invaded by other organisms needs confirmation. But the Russian authors have found a ready means of cultivating the infecting agent which will pave the way for further investigation.

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[1] Archiv für Schiffs- und Tropen-Hygiene, 1923, Nr. 2.

ACID-FASTNESS.

ALTHOUGH acid-fastness has always been associated with the fatty constituents of the bacillus, this property cannot be removed from the organism by extraction with fat solvents alone. This fact may be considered well established, as Dr. J. A. Shaw-Mackenzie reminds us in his letter in another part of this issue. Aronson[1] it was who showed that if the organisms are treated with an acid in addition to fat solvents the acid-fastness can be completely removed by prolonged extraction. This important piece of work was confirmed by many workers, including Bulloch and Macleod,[2] Much and Deycke,[3] and others. The latter observers also showed that any organic acid such as lactic would answer the purpose. Prof. Dreyer finds that he can remove the acid-fastness by the action of formalin and fat solvent extraction. No explanation is advanced for the action of formalin in place of the usual acid treatment, but it seems probable that it may act by virtue of the appreciable amount of formic acid always present in 40 per cent. formalin. If this is the case the action would be analogous to the reaction of Much and Deycke with lactic acid. The bacilli obtained by this combined formalin and fat extraction treatment are made into an antigen apparently possessing valuable therapeutic properties. Since the discovery and preparation of tuberculin by Koch a large amount of literature has collected on the methods of preparation of tubercular antigens. By varying the technique each worker has hoped to produce an antigen more sensitive for both diagnostic and therapeutic purposes. Gabrilowitsch[4] was probably the first to work on fractional antigens. In 1891 he described a "*tuberculum purum*," obtained by extracting bacilli with xylol, ether, chloroform, and alcohol. This preparation was used for therapeutic purposes. Armand-Delille,[5] in 1902, worked with ether- and chloroform-extracted bacilli, whilst Leber and Steinharter,[6] in 1908, used an antigen prepared from chloroform-extracted bacilli on 350 patients.

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[1] Aronson: Berlin. klin. Woch., 1898, xxxv., 484; also 1910, xlvii., 1617.

[2] Bulloch and Macleod: Jour. Hyg., 1904, iv., 1.

[3] Much: Beitr. klin. Tuberk., 1911, xx., 315; also 1911, xx., 353.

[4] Gabrilowitsch: Wien. med. Woch., 1891, No. 4.

[5] Armand-Delille: Arch. Exp. Path., 1902.

[6] Leber and Steinharter: Munch. med. Woch., 1908, No. 25.

general malaise, and great pain, most marked in the affected joints. Locally there is a small circumscribed swelling and slight tenderness, but no cases of abscess formation or of necrosis have been observed, nor has there been any disturbance of the function of the renal, vascular, or hæmopoietic systems. The reaction subsides completely in 24 or at most 48 hours and the patient feels perfectly well. Combined with the sulphur therapy, such external applications as hot air, baths, massage, and passive movements should be persisted in, and it is important that these should not be omitted, for it is only during the sulphur treatment that their maximum benefit can be obtained. The result of the treatment on the joints is that there is rapid diminution of pain, the swelling decreases, and the range of movement is markedly increased, while the general condition of the patient correspondingly improves. Acute affections which respond to salicylates were not treated by this method.

COMMITTEE ON THE USE OF PRESERVATIVES IN FOOD.

As we recently announced, a deputation of medical officers of health and others to the Ministry of Health, urging the need for further control in the use of food preservatives, received the gratifying assurance that a committee was being appointed to consider the whole question. The personnel of this Committee is as follows: Sir H. C. Monro, K.C.B. (chairman); Prof. W. E. Dixon, M.D., F.R.S.; Sir A. D. Hall, K.C.B., F.R.S.; Dr. J. M. Hamill; Mr. O. Hehner, F.I.C.; Prof. F. G. Hopkins, F.R.S.; Dr. G. R. Leighton; Dr. A. P. Luff; Dr. C. Porter; Mr. G. Stubbs, F.I.C. They are asked to inquire into the use of preservatives and colouring matters in food and to report:—

1. Whether the use of such materials or any of them for the preservation and colouring of food is injurious to health, and, if so, in what quantities does their use become injurious.

2. Whether it should be required that the presence of such materials and the quantities present in food offered or exposed for sale should be declared.

The secretary of the Committee is Mr. A. M. Legge, of the Ministry of Health, Whitehall, S.W., to whom all communications should be addressed.

LEGITIMATE REQUIREMENT OF OPIUM.

IN the July number of the *Contemporary Review* appears an article by Sir William Collins dealing with the present position of the opium traffic. It will be remembered that Sir William Collins, together with Mr. (now Sir) William Max-Muller, signed, on behalf of the British Government, the Convention drafted at the First International Opium Conference held at The Hague in 1912. Since 1919 the League of Nations has been entrusted with the carrying into effect of the Convention, in so far as the States which are members of the League are concerned. We have repeatedly referred to the work of the Advisory Committee on Opium, appointed by the Council of the League to supervise the execution of the Convention.[1] The Committee has continued the work formerly carried out by the Netherlands Government in endeavouring to secure ratification of the Convention by all the Powers, and has made an attempt, in coöperation with the Health Committee of the League, to ascertain the amount of opium, morphia, cocaine, and heroin required for legitimate consumption, but so far with inconclusive results. The problem of the "legitimate" needs of one country and another has given rise to much discussion, particularly with regard to India. The Indian Government takes its stand on the findings of the Royal Commission of 1895, to the effect that prohibition of poppy cultivation and the manufacture and sale of opium in British India would involve the destruction of the heavy export trade in Bengal opium to China and elsewhere, and would inflict a heavy loss of public revenue on the Government and people of India. The Commission also found that opium was a "universal household remedy," that it was "extensively administered to infants," and that it was used as a stimulant and prophylactic against malaria and fever. The Indo-Chinese trade, however, was terminated in 1917; some 14,000 chests of Indian Government opium are annually exported to meet the "legitimate requirements of the non-China markets"—the latter including the Straits Settlements and North Borneo. The Indian Government condemns opium-smoking as "essentially a social vice," and, speaking generally, it is their policy to "confine the use of the drug within the narrowest possible limits." The manufacture of opium for smoking in India is said to be prohibited except by the individual for his own use. With regard to China, it is to be regretted that this country, which was reported to be free from poppy cultivation in 1917, has since resumed a large production of opium, by the action of provincial governors in defiance of commands from Peking. In a recent issue we dealt with the estimated legitimate needs of China—2000 oz. for a population of 400 millions with a yearly sickness incidence set at 20 millions.[2] At the session of the Advisory Committee held at Geneva in June, the United States representatives pressed for limitation of production of the drugs dealt with in the Convention to the amounts required for strictly medicinal and scientific purposes. This proposition was apparently approved subject to a reservation on behalf of the Government of India, and to a declaration that so long as opium-smoking is not, as the Convention of 1912 contemplated it should be, suppressed, opium raised for that purpose is to be deemed legitimate. Sir William Collins in his article described a personal inquiry into the legitimate use of the drugs in question, as follows:—

> "With the assistance of Mr. Langford Moore, pharmacist to St. Bartholomew's Hospital, I have recently ascertained *that at ten* of the larger London hospitals, treating 70,000 in-patients and 550,000 out-patients a year, the amount of opium used is about 40 lb. per annum, of morphia 5¼ lb., and of cocaine just over 9 lb. These relatively modest amounts, which suffice for the legitimate medical treatment of 620,000 sick and injured persons in a year, contrast strikingly with the hundreds of thousands of kilograms of opium annually raised, and the tons of morphia and cocaine annually manufactured and exported."

These findings form another useful indication of the actual quantity of drugs of addiction which is necessary for the use of the world; it is for the League of Nations, with the aid of the United States, to strive for prevention of any output in excess of that quantity.

SIMULTANEOUS OBSERVATIONS ON GASTRIC AND DUODENAL SECRETIONS.

THE interesting studies on human digestive secretions which have emanated from the Department of Physiology of the University of Edinburgh have been extended by the introduction of a new technique. We recently published[3] an article by Dr. A. R. Matheson and Dr. S. E. Ammon describing the vigorous secretion of gastric juice which appears in the fasting human stomach in response to a hypodermic injection of histamine. In the current number of the *Edinburgh Medical Journal* Drs. R. K. S. Lim, A. R. Matheson, and W. Schlapp give a preliminary account[4] of their latest work. They introduce two tubes, the first into the duodenum, the second into the stomach, and by applying continuous aspiration to both of these they are able to recover the main bulk of the secretions both of the stomach and the duodenum; the method has the great additional advantage that the duodenal secretion is unadulterated with gastric contents, these being removed separately. Three experiments on normal subjects are described: in all of these a marked increase in gastric secretion was

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[1] THE LANCET, 1921, ii., 518, 1230; 1922, i., 1061.

[2] THE LANCET, June 23rd, p. 1274.

[3] THE LANCET, 1923, i., 482.

[4] Edin. Med. Jour., July, 1923.

(see p. 69) that the principal speakers and the points raised did not greatly differ from those at the 1921 discussion. Dr. Eric Pritchard opened with an exposition of his well-known views, which are too sane and broad to stimulate active opposition. Dr. Harold Waller has not found reason to modify his attitude of scepticism on milk as the ideal diet for the healthy weanling. The discussion yielded questions rather than information; Dr. Pritchard resisted firmly attempts made to force him to make oracular pronouncements, intimating that neither he nor anyone else is yet in a position to dogmatise on the ideal diet for children—or indeed for adults. The difficulty is not one of simple progression towards a known goal, but concerns rather the solution of the problem of finding without mathematical instruments the centre of a scalene triangle whose dreaded angles are malnutrition, constipation, and dental caries. It may be easy to find a point equidistant from any two of these acknowledged evils, only to find ourselves perilously near the third. Diets with little indigestible matter are not likely to give stimulation to the bowels of children of costive habit, and bulky carbohydrate foods, though condemned by the dentist and by the dietician, are often prescribed by the physician. Again, the hard food requiring mastication which is desirable to keep even milk teeth in good condition and promote the cleansing flow of saliva may well be beyond the digestive powers of the gastric juice of a very young child, whereas lump or barley sugar, cheap, digestible, of excellent energy value, soluble, and consumed with avidity by children, is hardly ever prescribed even for the marasmic child, possibly out of undue consideration for the teeth. A compromise must be arrived at, and no progress will be made until it is recognised that the contradictory advice so bewildering to mothers is the result of a real conflict between the aims of individual specialists who consider as of primary importance the general nutrition, the conservation of the teeth, or the maintenance of regular defæcation without aperients.

AN INDICTMENT OF PROTEIN TREATMENT.

THE idea that stimulation and irritation of the tissues can be exploited for the benefit of the patient is far from new, and Virchow's teachings in this connexion date many decades back. But it is only of late that protein activation in one or other of its aliases has become a popular vogue, and in Germany, at any rate, the practice of giving remedies by parenteral injection for almost every complaint has become very common. If this treatment is as effective as the list of substances for parenteral injection is long, there would surely be no scope for any other form of treatment. The favourites in this list would seem to be sterilised milk or a 5 per cent. solution of casein, a suspension of sulphur in olive oil, collargol, phylacogen, jodormone (a compound of iodine with horse serum), sanarthrit (a cartilaginous extract), yatren-casein, vaccineurin, ophthalmosan, and other milk products. There are many other proprietary remedies in the same class, and most, or all of them, are supposed to be beneficial on account of focal and general reactions. A feature of this form of medication, which is very impressive from the patient's point of view, is the fact that the physician's prophecy that a febrile reaction will occur in so many hours actually comes true. There is nothing which impresses the patient and gives him faith in both physician and remedy so much as a prognosis which comes true not merely to the day, but to the hour; to have a reputation for omniscience is helpful in practice, but to be blest with a reputation for prescience may be even better. During the last year or two doubts have been expressed in more than one quarter as to the permanency of the effects of "Reizterapi" (as it is known in the Scandinavian countries), and at the Bispebjaerg Hospital in Copenhagen a systematic attempt has been made by Dr. H. Jansen and Dr. E. Begtrup[1] to study the effects of this treatment on chronic disease of the joints. To make the trial as fair as possible, they dispensed with other remedies in as many cases as possible, and selected comparatively early cases of joint disease for their tests. These were made with subcutaneous, intramuscular, or intravenous injections of caseosan, intragluteal injections of a suspension of sulphur in olive oil or of plain, sterilised cow's milk. Intravenous injections of collargol and subcutaneous injections of phylacogen were also given, and two new preparations not yet put on the market by their German inventors, were also tested. The records of many of the cases are published in detail, and common to practically every case was the observation that whether the immediate results were good, bad, or indifferent the patients were ultimately little or no better off than before. Sooner or later practically all these patients had to fall back on hydropathic and other physical remedies, the effects of which were on the whole very much better than those of "Reizterapi." The authors' fair tests and critical analysis of this treatment may chill the ardour of some of its supporters.

THE CHILDREN'S SANATORIUM AT HOLT.

THE Children's Sanatorium at Holt, Norfolk, was originally intended only for early cases of pulmonary tuberculosis in the poor. Poverty, however, is a relative matter, and the governing body has recently decided to set aside a ward for children of middle-class parents who are not in a position to afford the necessarily high fees of private sanatoriums. The weekly charge for these patients will be £2 2s., and they will have the same treatment as the other children except for the sleeping arrangements. It is satisfactory to learn from the last annual report of the sanatorium that the average duration of treatment is as long as 41 weeks, and that it makes no "cure-you-while-you-wait" claims. During 1922 all the available 48 beds were occupied, and the number of in-patients was 56. We are sure that the new arrangement will materially increase the usefulness of this institution.

SULPHUR IN THE TREATMENT OF ARTHRITIS.

SULPHUR has long been used in the treatment of skin affections and as an adjunct in the treatment of syphilis, but only recently has it been used at all extensively for the relief of joint affections. The chronic rheumatoid and osteo-arthritic conditions might well be placed foremost among the diseases which cause the greatest and most prolonged suffering and disability to the patient and the greatest perplexity to the practitioner, the very hopelessness of all known methods of treatment driving him to despair and leading him to expend his energy and thought on other more profitable fields of research. From the reports received it appears that sulphur given intramuscularly in the form of an oily emulsion has a specific effect on chronic arthritic conditions, and while not in every case producing complete restoration of function, affords a very great measure of relief from pain and increase in mobility, thus enabling the patient to return to a useful and comfortable existence. Dr. Herbert Hayn,[1] of Breslau, reports 11 cases of different forms of arthritis, including acute and chronic rheumatoid and osteo-arthritis, gonococcal arthritis, and gout, some of many years' duration and completely bedridden. In all an undoubted improvement was seen, most noticeable in those cases which had resisted the orthodox methods of treatment, and bedridden patients left the hospital walking. The sulphur therapy consists of intramuscular injections of a 1–8 per cent. emulsion of sulphur in oil, repeated at intervals of 5–6 days. The number of injections required varies, in the cases reported from 5–13. The immediate reaction to the injection, which is independent of the quantity given, is severe. The temperature rises within 12 hours to 40° C. and a rigor occurs, the patient complains of intense headache, circular suture of any tube tends to narrow its lumen, and the urethra is neither so large nor so distensible that this narrowing can be permitted with impunity. The passage of large bougies frequently tears the freshly united tissues, inflicting further injury which can only repair by the formation of more scar-tissue; there results a vicious circle.

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[1] Ugeskrift for Laeger, June 14th, 1923.

[1] Deutsche medizinische Wochenschrift, May 25th, 1923.

The Principles of Treatment and Their Application.

Certain principles may be outlined: (1) Urine must not be allowed in contact with the damaged area until healing is complete. (2) The torn ends of the urethra must be brought into apposition. (3) No foreign body, such as a catheter, must be allowed in contact with the urethral wound during the process of healing. (4) After union, the urethral channel at the site of the injury must not be re-injured by the frequent passage of unnecessarily large bougies. On these principles all cases of rupture of the urethra in which blood escapes from the meatus require operation. In contusions without bleeding from the urethra the use of the catheter is permissible and may suffice, but if there is increasing difficulty or a swelling develops in the perineum, operation is indicated. There is a type of case in which the symptoms, after an injury to the perineum, are often accounted too slight to need treatment; there are pain and passage of a little blood, but there is little or no difficulty in micturition. In these very slight cases operation, even if limited to perineal drainage behind the site of the injury, will have happier results than expectant treatment.

Treatment must be carried out before attempts to micturate have driven urine into the tissues around the canal or involuntary escape from an over-distended bladder has led to the same result. A delay of several hours may be unavoidable before the patient can be removed to a properly equipped hospital or the services of an operating surgeon secured, and certain temporising measures may have to be employed. The patient must be instructed not to attempt to micturate; a sedative may be administered to help him to desist. If operation cannot be undertaken within two or three hours of the accident, the bladder is distended and desire to micturate insistent, the bladder should be punctured suprapubically, using local anæsthesia, or without if a fine trocar and cannula, with aspiration apparatus, be used. The trocar is removed lest a fistula should develop, and the puncture repeated if necessary.

Operative treatment involves perineal section, exposure and repair of the injury, and temporary perineal drainage of the bladder. The patient is in the lithotomy posture in a good light and a catheter or a rigid staff is passed to the site of the injury. An incision of ample length is then made, from the base of the scrotum to near the anus, and is deepened until the urethra is reached. The site of the tear, indicated by blood-clots, should be fully exposed and all clots wiped away or removed gently with a spoon until the exact amount of damage is ascertained. When the urethra is completely divided it may be a little troublesome to find the retracted proximal end; urine escaping or expelled by suprapubic pressure may furnish a useful guide. I have never met a case in which it was necessary to open the bladder for retrograde catheterisation. The distal end, if not at once found, can be identified by passing a rubber catheter from the meatus. The ends once found, can nearly always be approximated and should be fixed together by sutures joining only the roof and the sides of the canal. The floor is then represented by a diamond-shaped space which, when it heals by the approximation of the surrounding tissues, leaves the urethral channel larger at the site of the injury than elsewhere, thus allowing for some contraction which will inevitably occur. A rubber catheter may, if desired, be passed from the distal to the proximal urethra during the process of suturing, but in any event must be removed when the latter is completed. When the tear is limited to part of the circumference it is diminished by sutures but the floor is always left open. The approximation of the urethra being complete, the floor of the proximal end is incised in its long axis for half an inch backwards from the site of the tear. A rubber catheter, size 12 or larger, is then passed from the perineal wound through the incision in the floor of the posterior urethra into the bladder, and is fixed to the skin margin with a silk-worm suture. The catheter now lies in the posterior part of the perineal wound, while the sides and edges of the anterior part are drawn together over the sutured urethra. Only one or two stitches are necessary as the parts lie naturally in contact when the legs are extended side by side. If the urethra is pulped so that the gap cannot be bridged a catheter may be passed from the distal into the proximal segment; the segments are then drawn together as nearly as possible, the deficiency being made good by the surrounding tissues aided by any shreds of urethral mucous membrane, which are carefully cherished and laid along the catheter. It may be necessary to reconstruct the urethra with flaps of fascia lata or by some other device, but it is wonderful how often the channel is usefully restored without these aids when the urine is conducted away from the area during the process of healing. Some surgeons prefer to perform suprapubic cystotomy, but this is no more efficient than the perineal drain. While the catheter remains in the bladder it must be washed out twice daily to ensure that its lumen is kept free. As phosphates are liable to form around its end the patient must take 1 drachm of acid phosphate of soda and 15 gr. of urotropin in a glass of barley-water each day. The drainage catheter is removed in ten days, after which urine will escape from the perineum for a week or so and later will find its way through the normal channel. Three weeks after the operation, a Lister bougie 9/12 or a silver catheter No. 10 is very gently passed into the bladder; this will present no difficulty if the roof of the urethra is carefully followed. No force is permissible and no larger instrument is necessary. Three weeks later the same instrument is again used and if it passes easily need not be tried again for two months. If narrowed the passage should be dilated until it admits the 9/12 Lister, but no further. A similar instrument should be passed quarterly for a year, afterwards at increasing intervals.

Complications.—Old and Neglected Cases.

Secondary hæmorrhage on removal of the catheter from the perineum is treated by its reintroduction for 24 hours or by packing with iodoform gauze soaked in 1 in 1000 adrenalin solution. A tiny fistula persisting in the middle of the perineal wound may be cured by applications of pure carbolic or nitrate of silver fused on a straightened hairpin or a touch with a fine cautery point. In those cases in which extravasation has already occurred, the perineal swelling must be freely incised down to the site of injury and further incisions made wherever necessary. When possible the proximal urethra must be found and a catheter passed along it into the bladder as already directed, but no prolonged attempt should be made to expose the ends by dissection amidst tissues already infiltrated with sepsis. The main indication is to provide a ready escape for urine and products of infection. If this is successful the urethra may heal or a secondary operation may be carried out when the swelling has subsided.

Rupture of the Urethra Complicating Pelvic Injury.—In this condition the urethra is nearly always torn just at the apex of the prostate and extravasation occurs into the pelvic cellular tissue. The accident is an absolute indication for surgical interference and it is extremely important that it should be carried out before extravasation has occurred. Procedures already detailed may have to be supplemented by suprapubic drainage of the bladder as well as by incisions above the iliac crests for the relief of extravasation. Healing may occur with some deviation of the channel which may render it difficult to pass solid instruments into the bladder, though there may be no stricture or interference with micturition.

G. Grey Turner, M.S., F.R.C.S. Eng.,
Surgeon, Royal Infirmary, Newcastle-upon-Tyne.

obtained after administration of histamine, the increase being both in volume and in concentration of acid with a resultant great augmentation in total acid secretion. In two of the subjects there was no increase in duodenal secretion, and the slight increase in the third is believed to have been due to some escape of gastric contents into the duodenum. One of the most important lessons of this work would seem to be its reiteration of the fact that patience and care on the part of the observer are the only requisites for performing extensive experiments on the alimentary canal in the human subject. Duodenal tubage for diagnostic and therapeutic purposes is an everyday procedure in several clinics both in the United States and in Austria; our Edinburgh colleagues have again demonstrated that simultaneous passage of two tubes is a relatively easy matter and that useful observations can thus be obtained.

CEREBRAL CYSTS.

According to Dr. H. G. Jacobi,[1] of the Lenox Hill Hospital, New York, who records a case of his own, cerebral cysts are of infrequent occurrence and their detection by clinical means is extremely difficult. In most cases the diagnosis is not established until the autopsy. Of 299 cases of brain tumour in children collected by Starr, 30, or nearly 10 per cent., were cysts, which occupied the following situations: basal ganglia and lateral ventricle, 1; pons, 1; medulla, 1; base, 1; cerebellum, 9; and centrum ovale, 15; 2 of the tumours were multiple. The formation of cysts has been attributed to a variety of causes, perhaps the best classification being that of Bruns, who divided cysts into five groups according as they were: (1) of congenital origin; (2) parasitic, due to the cysticercus or more rarely the echinococcus; (3) traumatic, developing around spicules of bone; (4) the result of brain softening; (5) without any accountable ætiology. Dr. Jacobi's case, which was in an infant, aged 1 year, presented the following features of interest: (1) A sudden onset, simulating an acute infectious process; (2) indefinite signs and symptoms, making an ante-mortem diagnosis impossible; and (3) the presence of hyperglycæmia and glycosuria possibly due to pressure of the cyst on the fourth ventricle, as in the well-known experiment of Claude Bernard. Death took place in coma after three weeks' illness, and the autopsy showed a cyst containing creamy yellowish fluid situated beneath the posterior horn of the right lateral ventricle. From the chemical analysis of its contents, which showed that the principal constituent was pseudomucin, Dr. Jacobi is inclined to regard the cyst in his case as being of the proliferative type and of congenital origin.

THE INTERNATIONAL CONGRESS OF SURGEONS IN LONDON.

On Tuesday next the Sixth Congress of the International Society of Surgery opens at the House of the Royal Society of Medicine in London. The programme, which is an attractive one, is set out on p. 99. The Congress brings to this country a number of surgeons of world-wide distinction. The veteran Dr. W. W. Keen, of Philadelphia, now in his eighty-seventh year, expects to be present. Among the members of the committee who will take part are Prof. F. de Quervain, of Berne; Prof. Henri Hartmann, of Paris; Prof. Johan Nicolaysen, of Christiania; Dr. Th. Jonnesco, of Bucharest; Prof. C. F. A. Koch, of Groningen, and Prof. C. Willems, of Liége, the President of the Committee. Dr. William Mayo, of Rochester (Minn.), and Dr. Banting, of Toronto, will take part in the discussion on endocrine surgery; Dr. Crile, of Cleveland, in that on operative shock. The foreign guests will receive a warm welcome, not only officially from the Foreign Minister and the Minister of Health, but also from their surgical friends and colleagues in this country.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXVIII.—THE TREATMENT OF TRAUMATIC RUPTURE OF THE URETHRA.

Traumatic rupture of the urethra is a comparatively rare accident not in itself especially dangerous; but if mismanaged serious complications may ensue and the troublesome stricture which commonly follows has given it an unenviable notoriety.

Pathology.—The accident occurs (*a*) without injury to the bony pelvis; (*b*) as a complication of injury to the latter. In the former case the injury involves the urethra just in front of the triangular ligament in the region of the bulb, while in the latter it is above the ligament and therefore intrapelvic. In either case the urethra may be contused without laceration, or its mucous membrane may be partially torn or completely severed. In contusion there may be some submucous tearing of the urethral wall—interstitial rupture—but the mucous membrane is intact. In partial rupture a gaping wound involves the whole thickness of some part of the wall. In complete rupture there is usually a complete transverse tear, when the ends retract to the extent of an inch or more and they also contract; the tendency to occlusion is further aided by the pursing up of the torn mucous membrane and the accumulation of blood clot between the ends. The laceration may, however, be oblique or irregular, or a section of the whole urethra may be pulped, so that it subsequently necroses or is converted into a mass of scar-tissue. The extent of the injury disclosed when the parts are exposed is generally much greater than would be anticipated from the symptoms and physical signs. The outstanding features of urethral injuries are: (1) effusion of blood; (2) extravasation of urine, local or widespread; (3) infection. Some of the bleeding occurs into the lumen of the canal, escaping through the meatus, but a considerable amount infiltrates the tissues outside the urethra and between the margins of the wound in its walls. The extravasation of urine may be localised to the immediate vicinity of the injury, or may be more widely diffused into the cellular tissue of the perineum delimited by the fascia of Colles, or into the corresponding tissue outside the peritoneum where the injury is above the triangular ligament. Infection may be limited to the parts surrounding the urethra, with or without a localised abscess, or may follow the extravasation.

How Healing is Brought About.—When the urethral wound is kept in apposition, and there is no infection, healing readily takes place with a minimum of scar-tissue; otherwise, healing can only occur slowly by granulation with the maximum of scar-tissue. In complete rupture the channel may be fortuitously restored though seriously narrowed, but more commonly complete obliteration of a section of the urethra occurs, the urine escaping through sinuses.

Faults in Current Teaching.—Many text-books teach that an attempt should be made to pass a catheter into the bladder, the instrument being tied in and left for eight to ten days. Should catheterisation be impossible, perineal section is advocated, the urethra to be carefully and completely sutured around an instrument. In either case large bougies are to be frequently passed for a few weeks.

Now even if a catheter can be passed, the conditions are not ideal for healing. When a catheter rests in the sphincter, the latter relaxes, allowing urine to trickle by its side into the urethra towards the wound, and this invariably leads to infection. Apart from this leakage, the constant presence of the catheter itself acts as an irritant and is almost always associated with some slight infection—harmless in the normal urethra, but a forerunner of scar-tissue in a urethral wound. Again, it must be recognised that complete circular suture of any tube tends to narrow its lumen, and the urethra is neither so large nor so distensible that this narrowing can be permitted with impunity. The passage of large bougies frequently tears the freshly united tissues, inflicting further injury which can only repair by the formation of more scar-tissue; there results a vicious circle.

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[1] American Journal of Diseases of Children, June, 1923.

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Certain principles may be outlined: (1) Urine must not be allowed in contact with the damaged area until healing is complete. (2) The torn ends of the urethra must be brought into apposition. (3) No foreign body, such as a catheter, must be allowed in contact with the urethral wound during the process of healing. (4) After union, the urethral channel at the site of the injury must not be re-injured by the frequent passage of unnecessarily large bougies. On these principles all cases of rupture of the urethra in which blood escapes from the meatus require operation. In contusions without bleeding from the urethra the use of the catheter is permissible and may suffice, but if there is increasing difficulty or a swelling develops in the perineum, operation is indicated. There is a type of case in which the symptoms, after an injury to the perineum, are often accounted too slight to need treatment; there are pain and passage of a little blood, but there is little or no difficulty in micturition. In these very slight cases operation, even if limited to perineal drainage behind the site of the injury, will have happier results than expectant treatment.

Treatment must be carried out before attempts to micturate have driven urine into the tissues around the canal or involuntary escape from an over-distended bladder has led to the same result. A delay of several hours may be unavoidable before the patient can be removed to a properly equipped hospital or the services of an operating surgeon secured, and certain temporising measures may have to be employed. The patient must be instructed not to attempt to micturate; a sedative may be administered to help him to desist. If operation cannot be undertaken within two or three hours of the accident, the bladder is distended and desire to micturate insistent, the bladder should be punctured suprapubically, using local anæsthesia, or without if a fine trocar and cannula, with aspiration apparatus, be used. The trocar is removed lest a fistula should develop, and the puncture repeated if necessary.

Operative treatment involves perineal section, exposure and repair of the injury, and temporary perineal drainage of the bladder. The patient is in the lithotomy posture in a good light and a catheter or a rigid staff is passed to the site of the injury. An incision of ample length is then made, from the base of the scrotum to near the anus, and is deepened until the urethra is reached. The site of the tear, indicated by blood-clots, should be fully exposed and all clots wiped away or removed gently with a spoon until the exact amount of damage is ascertained. When the urethra is completely divided it may be a little troublesome to find the retracted proximal end; urine escaping or expelled by suprapubic pressure may furnish a useful guide. I have never met a case in which it was necessary to open the bladder for *retrograde* catheterisation. The distal end, if not at once found, can be identified by passing a rubber catheter from the meatus. The ends once found, can nearly always be approximated and should be fixed together by sutures joining only the roof and the sides of the canal. The floor is then represented by a diamond-shaped space which, when it heals by the approximation of the surrounding tissues, leaves the urethral channel larger at the site of the injury than elsewhere, thus allowing for some contraction which will inevitably occur. A rubber catheter may, if desired, be passed from the distal to the proximal urethra during the process of suturing, but in any event must be removed when the latter is completed. When the tear is limited to part of the circumference it is diminished by sutures but the floor is always left open. The approximation of the urethra being complete, the floor of the proximal end is incised in its long axis for half an inch backwards from the site of the tear. A rubber catheter, size 12 or larger, is then passed from the perineal wound through the incision in the floor of the posterior urethra into the bladder, and is fixed to the skin margin with a silk-worm suture. The catheter now lies in the posterior part of the perineal wound, while the sides and edges of the anterior part are drawn together over the sutured urethra. Only one or two stitches are necessary as the parts lie naturally in contact when the legs are extended side by side. If the urethra is pulped so that the gap cannot be bridged a catheter may be passed from the distal into the proximal segment; the segments are then drawn together as nearly as possible, the deficiency being made good by the surrounding tissues aided by any shreds of urethral mucous membrane, which are carefully cherished and laid along the catheter. It may be necessary to reconstruct the urethra with flaps of fascia lata or by some other device, but it is wonderful how often the channel is usefully restored without these aids when the urine is conducted away from the area during the process of healing. Some surgeons prefer to perform suprapubic cystotomy, but this is no more efficient than the perineal drain. While the catheter remains in the bladder it must be washed out twice daily to ensure that its lumen is kept free. As phosphates are liable to form around its end the patient must take 1 drachm of acid phosphate of soda and 15 gr. of urotropin in a glass of barley-water each day. The drainage catheter is removed in ten days, after which urine will escape from the perineum for a week or so and later will find its way through the normal channel. Three weeks after the operation, a Lister bougie 9/12 or a silver catheter No. 10 is very gently passed into the bladder; this will present no difficulty if the roof of the urethra is carefully followed. No force is permissible and no larger instrument is necessary. Three weeks later the same instrument is again used and if it passes easily need not be tried again for two months. If narrowed the passage should be dilated until it admits the 9/12 Lister, but no further. A similar instrument should be passed quarterly for a year, afterwards at increasing intervals.

Complications.—Old and Neglected Cases.

Secondary hæmorrhage on removal of the catheter from the perineum is treated by its reintroduction for 24 hours or by packing with iodoform gauze soaked in 1 in 1000 adrenalin solution. A tiny fistula persisting in the middle of the perineal wound may be cured by applications of pure carbolic or nitrate of silver fused on a straightened hairpin or a touch with a fine cautery point. In those cases in which extravasation has already occurred, the perineal swelling must be freely incised down to the site of injury and further incisions made wherever necessary. When possible the proximal urethra must be found and a catheter passed along it into the bladder as already directed, but no prolonged attempt should be made to expose the ends by dissection amidst tissues already infiltrated with sepsis. The main indication is to provide a ready escape for urine and products of infection. If this is successful the urethra may heal or a secondary operation may be carried out when the swelling has subsided.

Rupture of the Urethra Complicating Pelvic Injury.—In this condition the urethra is nearly always torn just at the apex of the prostate and extravasation occurs into the pelvic cellular tissue. The accident is an absolute indication for surgical interference and it is extremely important that it should be carried out before extravasation has occurred. Procedures already detailed may have to be supplemented by suprapubic drainage of the bladder as well as by incisions above the iliac crests for the relief of extravasation. Healing may occur with some deviation of the channel which may render it difficult to pass solid instruments into the bladder, though there may be no stricture or interference with micturition.

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obtained after administration of histamine, the increase being both in volume and in concentration of acid with a resultant great augmentation in total acid secretion. In two of the subjects there was no increase in duodenal secretion, and the slight increase in the third is believed to have been due to some escape of gastric contents into the duodenum. One of the most important lessons of this work would seem to be its reiteration of the fact that patience and care on the part of the observer are the only requisites for performing extensive experiments on the alimentary canal in the human subject. Duodenal tubage for diagnostic and therapeutic purposes is an everyday procedure in several clinics both in the United States and in Austria; our Edinburgh colleagues have again demonstrated that simultaneous passage of two tubes is a relatively easy matter and that useful observations can thus be obtained.

CEREBRAL CYSTS.

According to Dr. H. G. Jacobi,[1] of the Lenox Hill Hospital, New York, who records a case of his own, cerebral cysts are of infrequent occurrence and their detection by clinical means is extremely difficult. In most cases the diagnosis is not established until the autopsy. Of 299 cases of brain tumour in children collected by Starr, 30, or nearly 10 per cent., were cysts, which occupied the following situations: basal ganglia and lateral ventricle, 1; pons, 1; medulla, 1; base, 1; cerebellum, 9; and centrum ovale, 15; 2 of the tumours were multiple. The formation of cysts has been attributed to a variety of causes, perhaps the best classification being that of Bruns, who divided cysts into five groups according as they were: (1) of congenital origin; (2) parasitic, due to the cysticercus or more rarely the echinococcus; (3) traumatic, developing around spicules of bone; (4) the result of brain softening; (5) without any accountable ætiology. Dr. Jacobi's case, which was in an infant, aged 1 year, presented the following features of interest: (1) A sudden onset, simulating an acute infectious process; (2) indefinite signs and symptoms, making an ante-mortem diagnosis impossible; and (3) the presence of hyperglycæmia and glycosuria possibly due to pressure of the cyst on the fourth ventricle, as in the well-known experiment of Claude Bernard. Death took place in coma after three weeks' illness, and the autopsy showed a cyst containing creamy yellowish fluid situated beneath the posterior horn of the right lateral ventricle. From the chemical analysis of its contents, which showed that the principal constituent was pseudomucin, Dr. Jacobi is inclined to regard the cyst in his case as being of the proliferative type and of congenital origin.

THE INTERNATIONAL CONGRESS OF SURGEONS IN LONDON.

On Tuesday next the Sixth Congress of the International Society of Surgery opens at the House of the Royal Society of Medicine in London. The programme, which is an attractive one, is set out on p. 99. The Congress brings to this country a number of surgeons of world-wide distinction. The veteran Dr. W. W. Keen, of Philadelphia, now in his eighty-seventh year, expects to be present. Among the members of the committee who will take part are Prof. F. de Quervain, of Berne; Prof. Henri Hartmann, of Paris; Prof. Johan Nicolaysen, of Christiania; Dr. Th. Jonnesco, of Bucharest; Prof. C. F. A. Koch, of Groningen, and Prof. C. Willems, of Liége, the President of the Committee. Dr. William Mayo, of Rochester (Minn.), and Dr. Banting, of Toronto, will take part in the discussion on endocrine surgery; Dr. Crile, of Cleveland, in that on operative shock. The foreign guests will receive a warm welcome, not only officially from the Foreign Minister and the Minister of Health, but also from their surgical friends and colleagues in this country.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXVIII.—THE TREATMENT OF TRAUMATIC RUPTURE OF THE URETHRA.

Traumatic rupture of the urethra is a comparatively rare accident not in itself especially dangerous; but if mismanaged serious complications may ensue and the troublesome stricture which commonly follows has given it an unenviable notoriety.

Pathology.—The accident occurs (*a*) without injury to the bony pelvis; (*b*) as a complication of injury to the latter. In the former case the injury involves the urethra just in front of the triangular ligament in the region of the bulb, while in the latter it is above the ligament and therefore intrapelvic. In either case the urethra may be contused without laceration, or its mucous membrane may be partially torn or completely severed. In contusion there may be some submucous tearing of the urethral wall—interstitial rupture—but the mucous membrane is intact. In partial rupture a gaping wound involves the whole thickness of some part of the wall. In complete rupture there is usually a complete transverse tear, when the ends retract to the extent of an inch or more and they also contract; the tendency to occlusion is further aided by the pursing up of the torn mucous membrane and the accumulation of blood clot between the ends. The laceration may, however, be oblique or irregular, or a section of the whole urethra may be pulped, so that it subsequently necroses or is converted into a mass of scar-tissue. The extent of the injury disclosed when the parts are exposed is generally much greater than would be anticipated from the symptoms and physical signs. The outstanding features of urethral injuries are: (1) effusion of blood; (2) extravasation of urine, local or widespread; (3) infection. Some of the bleeding occurs into the lumen of the canal, escaping through the meatus, but a considerable amount infiltrates the tissues outside the urethra and between the margins of the wound in its walls. The extravasation of urine may be localised to the immediate vicinity of the injury, or may be more widely diffused into the cellular tissue of the perineum delimited by the fascia of Colles, or into the corresponding tissue outside the peritoneum where the injury is above the triangular ligament. Infection may be limited to the parts surrounding the urethra, with or without a localised abscess, or may follow the extravasation.

How Healing is Brought About.—When the urethral wound is kept in apposition, and there is no infection, healing readily takes place with a minimum of scar-tissue; otherwise, healing can only occur slowly by granulation with the maximum of scar-tissue. In complete rupture the channel may be fortuitously restored though seriously narrowed, but more commonly complete obliteration of a section of the urethra occurs, the urine escaping through sinuses.

Faults in Current Teaching.—Many text-books teach that an attempt should be made to pass a catheter into the bladder, the instrument being tied in and left for eight to ten days. Should catheterisation be impossible, perineal section is advocated, the urethra to be carefully and completely sutured around an instrument. In either case large bougies are to be frequently passed for a few weeks.

Now even if a catheter can be passed, the conditions are not ideal for healing. When a catheter rests in the sphincter, the latter relaxes, allowing urine to trickle by its side into the urethra towards the wound, and this invariably leads to infection. Apart from this leakage, the constant presence of the catheter itself acts as an irritant and is almost always associated with some slight infection—harmless in the normal urethra, but a forerunner of scar-tissue in a urethral wound. Again, it must be recognised that complete ing to Kenya, it may be said that while limited portions of the high tablelands would appear to be blessed with climatic conditions which should suffice for purposes of stimulation, it is, to say the least, doubtful if this can be predicated of the whole elevated area over which white settlers are scattered, and more especially of Nairobi and its immediate neighbourhood. Still, only time can show, and it should be remembered that we do not yet know if marked changes in the 24 hours as, say, between the day and night temperature or even considerable diurnal variations, can make up for the differences of season as experienced in temperate lands. The future is, as it were, upon the knees of the gods and, as we shall see, there may yet be developments which will modify the climate or enable men to defy it.

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[1] American Journal of Diseases of Children, June, 1923.

CLIMATE AND HUMAN METABOLISM.

Having considered the broader aspects of this question of the influence of tropical climate upon the white races of mankind it is time to discuss its effect on human metabolism in more detail. Huntington likens the influence of climate upon men to that of a driver upon his horse, and the simile is both homely and apt. He says :—

> "Some drivers let their horses go as they please. Now and then a horse may run away, but the average pace is slow. Such drivers are like an unstimulating climate. Others whip their horses and urge them to the limit all the time. They make rapid progress for a while, but in the end they exhaust their animals. They resemble climates which are always stimulating. In such climates nervous exhaustion is likely to prevail and insanity becomes common. A third type of drivers first whip their horses to a great speed for a mile or two, and then let them walk slowly for another mile or two. They often think that they are accomplishing great things, and they are better off than the two types already mentioned, but they still have much to learn. They are like a climate which has a strong contrast of seasons, one being favourable and the other unfavourable. Still a fourth kind of driver may whip his horse sometimes and sometimes let him walk, but what he does chiefly is to urge the animal gently with his voice, then check him a little with the rein. By alternate urging and checking he conserves the animal's strength, and in the long run can cover more distance and do it more rapidly than any of the others. Such a driver resembles a climate which has enough contrast of seasons to be stimulating but not to create nervous tension, and which also possesses frequent storms whose function is to furnish the slight urging and checking which are so valuable in the total effect, although each individual impulse is almost unnoticeable."

Now, save as regards the fourth type, which cannot be said to exist in the tropics, it is possible to cite countries within the torrid zone furnishing examples of these varieties of climate. The first, the unstimulating, is that met with along tropical littorals, as, for example, the West Coast of Africa, in great forests like those of the Amazon, or in islands like most of the West Indies or the Polynesian archipelago. The second type, producing over-stimulation, can be found only at high altitudes such as exist in the Andes. Parts of Peru—as, for instance, the region of Cuzco—may be cited. The third type, where there is one favourable and one unfavourable season, may be exemplified by desert climates like those of the Northern Sudan or Mesopotamia. In both countries the winter is bracing and pleasant, and in both the long and trying summer is hot as Tophet. Hence it is not surprising that the former has been described as a country where white women lose their looks and white men their energy.

Speaking broadly, the seasonal changes of a tropical climate, if at all marked, are beneficial rather than otherwise. It is tropical weather that is to blame, and it is at fault because it has not the characteristics of what we call weather in this country. There is far too much climate and far too little weather in the tropics. One is reminded of the schoolboy's essay on marriage customs wherein he spoke of the state of having one wife which, according to him, is called "monotony." The simile is not a bad one, for in both cases the even tenor of existence may be punctuated by storms!

From what has been said it must be clear that an equability of temperature, a powerful sun, and a high degree of atmospheric humidity are the climatic factors which in the moist tropics at least militate against the comfort and well-being of the white settler. In the dry tropics, excessive dryness of the air, together with sun and heat, is operative, and this combination is frequently associated with electrical states of the atmosphere which may conceivably play a much more important rôle than has hitherto been attributed to them. Whether that rôle, however, is deleterious or the reverse remains to be decided. It may be a cause of mental irritability. On the other hand, it may exercise a beneficial, stimulating effect. Kullmer,[10] an American geographer, was inclined to think that possibly electrical phenomena accompanying the barometric changes which induce storms had much to do with the advancement of civilisation. It is conceivable that the comparative innocuousness of desert climates in the tropics is due to the frequency and force of electric disturbances. The air at times becomes very highly charged, and it is astonishing how a blanket on the slightest movement will crackle and spark. I would suggest that this is a line of investigation well worth pursuing. Considering the amazing electrical developments of late years, who can say that such a study might not lead to the discovery of methods whereby the stimulating and rejuvenating action of electricity might not be utilised to counteract the depressing influence of a hot and humid climate? In such climates the effects of a severe thunderstorm are often remarkable. I recall a suffocating night on the Magdalena River in Colombia when one could scarcely breathe, so great was the oppression of the atmosphere, and the remarkable change produced in half an hour by a violent outburst of electricity.

PSYCHOLOGICAL EFFECTS.

Whatever the factors at work, the effects they produce may be classed as physiological, psychological, and pathological. Of these the greatest are the psychological, for Cuvier's axiom, already quoted, must ever be borne in mind. The psychological effects are purely subjective and we are always conscious of them, which is by no means invariably the case as regards the physiological, and yet, though in many cases no proof can be advanced, the psychological effects are probably in every instance based upon physiological change. At any rate, it is better not to try and divorce them, but to consider the psychological effects as part of the physiological effects on the nervous system. It is true that these latter effects may be associated with psychological results, without there being any direct action on the nervous system, for the change may be induced in the circulatory or other apparatus, but the expression of the psychological effects must needs be through the brain. Although a consideration of the effects of a tropical climate on the individual may not supply data for determining the influence it will exert upon the white race viewed in the light of colonisers, yet this aspect of the subject cannot be wholly neglected. Indeed, it furnishes the greater part of the scientific evidence on which any conclusions can at present be formed. Unfortunately, the evidence is conflicting and far from being complete. I do not propose to discuss all the work that has been done on the physiological and pathological effects of tropical climates. It seems wiser, considering the magnitude of the subject, to refer very briefly to some of the more important observations made in the past and then to concentrate on recent contributions to the literature, commenting, where it seems desirable, on the statements and views which have been advanced and confining myself as much as possible to the hygienic aspect of the question.

BODY TEMPERATURE.

Naturally considerable attention has been directed to body temperature, but the earlier records leave much to be desired owing to the conditions under which the observations were made. There seems

Special Articles.

PROBLEMS OF ACCLIMATISATION.[*]

BY ANDREW BALFOUR, C.B., C.M.G.,
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THE preceding lecture was devoted to a somewhat comprehensive though by no means exhaustive account of intentional or unintentional white settlements in the tropics, and to a consideration of the various and varying views which have been advanced regarding such efforts at colonisation. There still remains, however, one important point which must not be forgotten, and that is the influence of altitude in modifying the climatic effects of a country in the tropic zone.

TROPICAL HIGHLANDS.

Kenya is much in the public eye at present and, so far as the British Empire is concerned, Kenya is the colony specially interested in this question. Unfortunately it is not one which can readily be answered. We know, of course, that in a climate like that of the East African highlands many Europeans can and do lead active and energetic outdoor lives. It is possible that, if native labour was not forthcoming, they could with impunity, so far as health is concerned, undertake the work which now falls to the lot of the Kikuyu and other sons of Ham. It has, indeed, been suggested that the European might labour like the native provided he knocked off work during the hot hours—i.e., from 10 A.M. to 3 P.M. This, however, would make a very short working day, which, I understand, would not satisfy the needs of the agriculturist.

The children, despite statements to the contrary, do well. I remember during the war attending a children's party at Government House, Nairobi, and being struck by the fitness and high spirits of the youthful guests. Save for the fact that they were somewhat pale, they would have compared favourably with a similar gathering of youngsters in this country. Moreover, a few children born in the colony have attained adult life and appear to be healthy and vigorous men and women. It must, however, be remembered that it is not merely a question of bodily health and energy. A weakening of will power is one of the first tokens that a hot climate is beginning to tell upon an individual and it manifests itself, as Huntington points out, in many ways, but chiefly along four lines—namely, lack of industry, irascibility of temper, drunkenness, and excess in venery. As we view the past and as the future unrolls, it will be interesting to see if some or any of these failings are in evidence, not only in the Kenya highlands, but elsewhere amongst European communities who have settled in tropical uplands. If such traits do make their appearances it will be well to recall the fact that while, as ever, several factors are concerned, climate may be playing an insidious but none the less definite part in lessening restraint. Speaking generally, the white population of Kenya is industrious and has faced manifold difficulties in a gallant manner, but it is a question if, as the long years pass, there will not be seen a tendency towards slackness, especially perhaps when the stimulus of rapid development has somewhat abated. Still, these are early days and there are scarcely any scientific data on which to base an opinion.

Steudel,[1] it is true, states that in the case of Europeans living in tropical highlands changes occur in the nervous system, if not in the first certainly in the second and subsequent generations. Indeed, he records the presence of neurasthenia amongst Germans who had been living at high altitudes in what is now known as Tanganyika territory. Naturally the altitude itself, provided it be considerable, complicates the question. The matter lies outside the scope of this lecture, but those interested may with advantage consult Hingston's[2] paper as regards India, and that of Ocaranza[3] who deals with Mexico. Meyer[4] has also considered the subject, so far as the blood picture is concerned, while Mackinnon[5] commenced a research at Nairobi on the cardiac condition in children. It is unfortunate that he was unable to continue his inquiries, but he has recently published an interesting paper[6] on education in its relation to the physical and mental development of European children of school age in Kenya. He finds that the warmth and light exercise a stimulating and salutary effect on growth, at least when the food conditions are satisfactory. Both as regards height and weight the Kenya children compare favourably with English children of the same age and presumably, though he does not say so, of the same social class. At first, also, there is a quickening of mentality. In fact, all goes well until the age of 10 years is reached, but thereafter a gradual process of mental exhaustion and deterioration supervenes, which appears especially to affect the memory and the power of application. So much is this the case that he considers that the Government would be well advised to limit any scheme for secondary education to such children as cannot be sent out of the country, and should, by establishing scholarships and providing monetary grants, enable children after the age of 10 to be despatched to the home country for the completion of their education. Here, then, there would appear to be definite evidence of the deleterious effect of climate upon the developing nervous system. Kohlbrugge,[7] also, with a long experience of Java, considers that a tropical mountain climate is very deleterious to the nervous system of Europeans. Altitude is said to be beneficial rather than harmful, as it favours lung expansion and increases the number of the red blood cells.

STIMULATING POWER OF CHANGEABLE CLIMATE.

So far as Kenya is concerned, if we put aside any possible influence which may be exerted by the native races or the immigrant East Indians, the future of the white race inhabiting its high plateaus would appear to depend on whether or not its climate has sufficient stimulating power. Now what are the attributes which confer upon a climate powers of stimulation? Moderate changes of temperature from one day to the next play a great part—indeed, it would seem a greater part than relative humidity, though the degree of humidity is important. It should, however, be noted that Schilling,[8] a German authority on the subject, is of opinion that an equable temperature is only deleterious because it is almost always associated with a high degree of atmospheric humidity. Be that as it may, there is no doubt that the ideal climate is characterised by moderate changes with air cooling at frequent intervals. According to Huntington,[9] mental activity reaches a maximum when the outside temperature averages about 38°, that is when there are mild frosts at night. Huntington also lays great stress on the influence of storms and, from a study of history, shows how climatic changes occurred in certain regions of the world, how such changes consisted primarily of a shifting of the belt of storms, how countries like China, Mesopotamia, Palestine, and Egypt, which in the olden days lay within the storm belt, possessed great civilisations and intelligent and vigorous people, and how, with a change of climate, there was retrogression. His "pulsatory hypothesis" of climate, as he terms it, signifying that changes have taken place irregularly in great waves, is certainly well worthy of consideration, as is the theory he has evolved from it, even if he finds it difficult to explain on his hypothesis the ancient culture of Indo-China and Ceylon. We cannot, however, follow him further in his argument; reverting to Kenya, it may be said that while limited portions of the high tablelands would appear to be blessed with climatic conditions which should suffice for purposes of stimulation, it is, to say the least, doubtful if this can be predicated of the whole elevated area over which white settlers are scattered, and more especially of Nairobi and its immediate neighbourhood. Still, only time can show, and it should be remembered that we do not yet know if marked changes in the 24 hours as, say, between the day and night temperature or even considerable diurnal variations, can make up for the differences of season as experienced in temperate lands. The future is, as it were, upon the knees of the gods and, as we shall see, there may yet be developments which will modify the climate or enable men to defy it.

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[*] The second of a series of lectures, delivered at St. Bartholomew's Hospital on June 14th under the auspices of the Academic Council of the University of London. The first lecture appeared in THE LANCET of June 30th.

CLIMATE AND HUMAN METABOLISM.

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From what has been said it must be clear that an equability of temperature, a powerful sun, and a high degree of atmospheric humidity are the climatic factors which in the moist tropics at least militate against the comfort and well-being of the white settler. In the dry tropics, excessive dryness of the air, together with sun and heat, is operative, and this combination is frequently associated with electrical states of the atmosphere which may conceivably play a much more important rôle than has hitherto been attributed to them. Whether that rôle, however, is deleterious or the reverse remains to be decided. It may be a cause of mental irritability. On the other hand, it may exercise a beneficial, stimulating effect. Kullmer,[10] an American geographer, was inclined to think that possibly electrical phenomena accompanying the barometric changes which induce storms had much to do with the advancement of civilisation. It is conceivable that the comparative innocuousness of desert climates in the tropics is due to the frequency and force of electric disturbances. The air at times becomes very highly charged, and it is astonishing how a blanket on the slightest movement will crackle and spark. I would suggest that this is a line of investigation well worth pursuing. Considering the amazing electrical developments of late years, who can say that such a study might not lead to the discovery of methods whereby the stimulating and rejuvenating action of electricity might not be utilised to counteract the depressing influence of a hot and humid climate? In such climates the effects of a severe thunderstorm are often remarkable. I recall a suffocating night on the Magdalena River in Colombia when one could scarcely breathe, so great was the oppression of the atmosphere, and the remarkable change produced in half an hour by a violent outburst of electricity.

PSYCHOLOGICAL EFFECTS.

Whatever the factors at work, the effects they produce may be classed as *physiological*, *psychological*, and *pathological*. Of these the greatest are the psychological, for Cuvier's axiom, already quoted, must ever be borne in mind. The psychological effects are purely subjective and we are always conscious of them, which is by no means invariably the case as regards the physiological, and yet, though in many cases no proof can be advanced, the psychological effects are probably in every instance based upon physiological change. At any rate, it is better not to try and divorce them, but to consider the psychological effects as part of the physiological effects on the nervous system. It is true that these latter effects may be associated with psychological results, without there being any direct action on the nervous system, for the change may be induced in the circulatory or other apparatus, but the expression of the psychological effects must needs be through the brain. Although a consideration of the effects of a tropical climate on the individual may not supply data for determining the influence it will exert upon the white race viewed in the light of colonisers, yet this aspect of the subject cannot be wholly neglected. Indeed, it furnishes the greater part of the scientific evidence on which any conclusions can at present be formed. Unfortunately, the evidence is conflicting and far from being complete. I do not propose to discuss all the work that has been done on the physiological and pathological effects of tropical climates. It seems wiser, considering the magnitude of the subject, to refer very briefly to some of the more important observations made in the past and then to concentrate on recent contributions to the literature, commenting, where it seems desirable, on the statements and views which have been advanced and confining myself as much as possible to the hygienic aspect of the question.

BODY TEMPERATURE.

Naturally considerable attention has been directed to body temperature, but the earlier records leave much to be desired owing to the conditions under which the observations were made. There seems

Special Articles.

PROBLEMS OF ACCLIMATISATION.*

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THE preceding lecture was devoted to a somewhat comprehensive though by no means exhaustive account of intentional or unintentional white settlements in the tropics, and to a consideration of the various and varying views which have been advanced regarding such efforts at colonisation. There still remains, however, one important point which must not be forgotten, and that is the influence of altitude in modifying the climatic effects of a country in the tropic zone.

TROPICAL HIGHLANDS.

Kenya is much in the public eye at present and, so far as the British Empire is concerned, Kenya is the colony specially interested in this question. Unfortunately it is not one which can readily be answered. We know, of course, that in a climate like that of the East African highlands many Europeans can and do lead active and energetic outdoor lives. It is possible that, if native labour was not forthcoming, they could with impunity, so far as health is concerned, undertake the work which now falls to the lot of the Kikuyu and other sons of Ham. It has, indeed, been suggested that the European might labour like the native provided he knocked off work during the hot hours—i.e., from 10 A.M. to 3 P.M. This, however, would make a very short working day, which, I understand, would not satisfy the needs of the agriculturist.

The children, despite statements to the contrary, do well. I remember during the war attending a children's party at Government House, Nairobi, and being struck by the fitness and high spirits of the youthful guests. Save for the fact that they were somewhat pale, they would have compared favourably with a similar gathering of youngsters in this country. Moreover, a few children born in the colony have attained adult life and appear to be healthy and vigorous men and women. It must, however, be remembered that it is not merely a question of bodily health and energy. A weakening of will power is one of the first tokens that a hot climate is beginning to tell upon an individual and it manifests itself, as Huntington points out, in many ways, but chiefly along four lines—namely, lack of industry, irascibility of temper, drunkenness, and excess in venery. As we view the past and as the future unrolls, it will be interesting to see if some or any of these failings are in evidence, not only in the Kenya highlands, but elsewhere amongst European communities who have settled in tropical uplands. If such traits do make their appearances it will be well to recall the fact that while, as ever, several factors are concerned, climate may be playing an insidious but none the less definite part in lessening restraint. Speaking generally, the white population of Kenya is industrious and has faced manifold difficulties in a gallant manner, but it is a question if, as the long years pass, there will not be seen a tendency towards slackness, especially perhaps when the stimulus of rapid development has somewhat abated. Still, these are early days and there are scarcely any scientific data on which to base an opinion.

Steudel,[1] it is true, states that in the case of Europeans living in tropical highlands changes occur in the nervous system, if not in the first certainly in the second and subsequent generations. Indeed, he records the presence of neurasthenia amongst Germans who had been living at high altitudes in what is now known as Tanganyika territory. Naturally the altitude itself, provided it be considerable, complicates the question. The matter lies outside the scope of this lecture, but those interested may with advantage consult Hingston's[2] paper as regards India, and that of Ocaranza[3] who deals with Mexico. Meyer[4] has also considered the subject, so far as the blood picture is concerned, while Mackinnon[5] commenced a research at Nairobi on the cardiac condition in children. It is unfortunate that he was unable to continue his inquiries, but he has recently published an interesting paper[6] on education in its relation to the physical and mental development of European children of school age in Kenya. He finds that the warmth and light exercise a stimulating and salutary effect on growth, at least when the food conditions are satisfactory. Both as regards height and weight the Kenya children compare favourably with English children of the same age and presumably, though he does not say so, of the same social class. At first, also, there is a quickening of mentality. In fact, all goes well until the age of 10 years is reached, but thereafter a gradual process of mental exhaustion and deterioration supervenes, which appears especially to affect the memory and the power of application. So much is this the case that he considers that the Government would be well advised to limit any scheme for secondary education to such children as cannot be sent out of the country, and should, by establishing scholarships and providing monetary grants, enable children after the age of 10 to be despatched to the home country for the completion of their education. Here, then, there would appear to be definite evidence of the deleterious effect of climate upon the developing nervous system. Kohlbrugge,[7] also, with a long experience of Java, considers that a tropical mountain climate is very deleterious to the nervous system of Europeans. Altitude is said to be beneficial rather than harmful, as it favours lung expansion and increases the number of the red blood cells.

STIMULATING POWER OF CHANGEABLE CLIMATE.

So far as Kenya is concerned, if we put aside any possible influence which may be exerted by the native races or the immigrant East Indians, the future of the white race inhabiting its high plateaus would appear to depend on whether or not its climate has sufficient stimulating power. Now what are the attributes which confer upon a climate powers of stimulation? Moderate changes of temperature from one day to the next play a great part—indeed, it would seem a greater part than relative humidity, though the degree of humidity is important. It should, however, be noted that Schilling,[8] a German authority on the subject, is of opinion that an equable temperature is only deleterious because it is almost always associated with a high degree of atmospheric humidity. Be that as it may, there is no doubt that the ideal climate is characterised by moderate changes with air cooling at frequent intervals. According to Huntington,[9] mental activity reaches a maximum when the outside temperature averages about 38°, that is when there are mild frosts at night. Huntington also lays great stress on the influence of storms and, from a study of history, shows how climatic changes occurred in certain regions of the world, how such changes consisted primarily of a shifting of the belt of storms, how countries like China, Mesopotamia, Palestine, and Egypt, which in the olden days lay within the storm belt, possessed great civilisations and intelligent and vigorous people, and how, with a change of climate, there was retrogression. His "pulsatory hypothesis" of climate, as he terms it, signifying that changes have taken place irregularly in great waves, is certainly well worthy of consideration, as is the theory he has evolved from it, even if he finds it difficult to explain on his hypothesis the ancient culture of Indo-China and Ceylon. We cannot, however, follow him further in his argument; revert-

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[*] The second of a series of lectures, delivered at St. Bartholomew's Hospital on June 14th under the auspices of the Academic Council of the University of London. The first lecture appeared in THE LANCET of June 30th.

these hot and arid regions, and renders them less trying, in the long run, than the humid tropics.

Probably of greater importance than the question of changes in the formed elements of the blood and the hæmoglobin is that of its chemical or physico-chemical constitution, though here we are on debatable ground. A consideration of the scanty literature on the subject emphasises the pressing need for bio-chemical work in the tropics. The bacteriologist, the protozoologist, the pathologist, and even the epidemiologist, have all thrown light upon tropical hygiene, but, with some notable exceptions, the physiologist, and more especially the bio-chemist, has not yet come into his own in this realm of research. I was sorry to see that some time ago the proposal to attach a bio-chemist to the staff of the London School of Tropical Medicine was negatived. His help would have been valuable even in this country, but there is a great field for him abroad, more especially in the direction of blood work. The Dutch, who are very much to the fore in all matters pertaining to tropical hygiene, have been quick to realise the importance of bio-chemistry in their tropical possessions. De Langen and Schut[25] [26] estimated the sugar content of the blood in native Javans and Europeans and in rabbits, guinea-pigs, and hens in Java. In all it was high, and in the case of Europeans and of the animals considerably higher than is the case in Europe. This hyperglycæmia is almost certainly associated with a deficiency in calcium and a reduction in the cholesterin of the blood. The Dutch observers ascribe the condition to heat. Humidity, it is said, may also play a part by stimulating the sympathetic nervous system which regulates the function of the suprarenal glands. The hepatic glycogen is no longer stored up as usual, the sugar content of the blood increases, and an attempt is made to throw off this excess of sugar in the circulating blood. It is eliminated through the kidneys, the so-called renal glycosuria, or is burned up. To the latter event is ascribed the "low fever" of the tropics which, if the Dutchmen are correct, has a climatic, not a parasitic cause. As hyperglycæmia disposes to neuritis and polyneuritis and favours invasion by the tubercle bacillus it will be seen that this research has an important bearing on the subject we are discussing. The condition cannot be the same as the *hyperglycæmia* observed by McCay[27] in Bengal, and which he attributed to excessive carbohydrate diet, for it appears soon after the arrival of Europeans in the tropics.

De Langen and Schut[28] have also investigated the fat content of the blood. A reduction in cholesterin has already been mentioned, and two-thirds of the blood-fat is cholesterin. The total fat content is somewhat higher in Europeans than in natives. It would take us too far afield to consider all their findings and deductions, but it may be said that the matter may have important bearings on diet in the tropics, for the blood lipoids which constitute the fat core proper—that is, the finely emulsified fat present in the serum either in a colloidal or invisible form—would appear to be intimately concerned with cell life and function. The difference in the cholesterin content of the blood of natives and Europeans was not thought to be wholly due to differences in diet. De Langen[29] invoked a special function of the endocrine glands to explain it, while Verhoef[30] was inclined to attribute it to climate. Now, however, it would seem that de Langen[31] has revised his views and is prepared to put down the low cholesterin content, in native convicts at least, to a scarcity of fat in the diet. The matter is still sub judice, and I only mention it as showing how much we are in the dark as regards these difficult but suggestive problems. The percentage of water in the blood of healthy individuals in the tropics has been shown to be practically the same as that of Europeans at home—i.e., 78·6 per cent.

So far as *circulatory change* is concerned the observations are very contradictory. I would therefore merely mention that the Australian workers at Townsville[12] found that humid heat produced a rise both in blood pressure and pulse-rate, while de Jonge,[32] working in the Dutch East Indies, maintains that the maximum blood pressure of Europeans does not diminish as the result of prolonged tropical residence.

Digestion and Excretion.

A hot climate at first stimulates digestion and the digestive functions, but the effect is evanescent, being soon followed by a diminution in appetite and some lowering of digestive activity, with an accompanying lessened desire for animal food. It is interesting to note that recent American experiments on dogs show that in hot weather the secretion of bile may strikingly diminish even if the food intake remains considerable.

The urinary excretion is diminished in the tropics, the daily output being about 500 to 700 c.cm., as against 1500 in temperate regions. The urine is concentrated, but it is a moot question whether or not it contains an equal amount of waste material to that found in the 1500 c.cm. Some say one thing, some another. Young,[33] in North Queensland, found the neutral sulphur content high, but was unable to say whether or not this was due to increased tissue metabolism. He noted a much higher specific gravity of the urine,[34] a diminution in the quantity of sodium chloride excreted and a lessening of the total nitrogen.

McCay,[35] in Bengal, did much work on Asiatics; but of more importance for our purpose are the observations of Campbell[36] in Singapore, a place where there is no cool season and the temperature averages 80° F. all the year round. There he found that race had no influence on the nitrogen partition and that for a European, a Eurasian, and several races of Asiatics alike the absolute quantities of total nitrogen, of urea nitrogen, and of uric-acid nitrogen were much lower than the standard figures for Europe. On the other hand, the percentages of urea nitrogen and uric-acid nitrogen did not materially differ from the standard, while the percentage of ammonia nitrogen was increased and absolute ammonia nitrogen was also often increased. McCay[27] did not estimate the creatinin nitrogen, dealing only with neutral sulphur. Campbell found the amount to be slightly lower than the European standard but the percentage higher.

In a Chinese, a European, and a Eurasian the total nitrogen per kilo of weight proved to be about the same as the standard. In other races it was lower. Campbell attributed the low results to the indirect effects of heat and humidity which lessen the desire for food and work, thus leading to poor physique and less muscular energy. This may be true in the case of the European and the Eurasian, but recent work by Read and Wang[37] at Peking in China, at a time when the weather was dry and cold, work carried out on Chinese and yielding results comparable with those of McCay, Campbell, and Young, would *seem to show that* the differences noted are entirely due to diet. In other words, an exogenous rather than an endogenous factor is at work, and the high cereal diets are probably the cause.

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(*Continued at foot of next page.*)

however, now to be a general agreement that when one passes from a temperate to a tropical climate a slight rise of body temperature, rarely exceeding 1·5° F. occurs, while after arrival in the tropics the body temperature of the newcomer tends to remain slightly elevated. Adjustment of temperature, however, soon takes place in most cases, though there are certain individuals, obviously unfitted for tropical life, who do not possess the power of adaptation. Caspari and Schilling,[11] who carried out some interesting comparative experiments on metabolism in Germany and the West Coast of Africa, found that an ordinary and well-balanced diet had no influence on body temperature either in the acclimatised or non-acclimatised European. Neither has moderate exercise, but, according to Young, Breinl, Harris, and Osborne,[12] who conducted investigations in North Queensland, prolonged exercise does cause a rise of temperature even in acclimatised persons. It is important to take the temperature in the rectum, not in the mouth or axilla. As Leonard Hill[13] has pointed out, atmospheric conditions in the tropics undoubtedly impose a strain on the heat-regulating mechanism of the body. Hence the very effort to keep the temperature normal tends towards exhaustion, and unfavourable conditions of diet and clothing, at least when combined with considerable or severe exercise, raise the body heat.

SKIN REACTION.

Closely associated with the question of body temperature is that of skin reaction, because the regulation of body temperature is secured by the evaporation of water from the surface of the body as well as from the lungs. Aron,[14] in Manila, showed that the brown-skinned man possesses a more sensitive cutaneous heat-regulating apparatus than his white brother. This is presumably due in the first instance to colour, as brown skin absorbs more heat than white skin and hence more rapidly, as the result of nerve stimulation, the stage is reached when perspiration shows itself. Moreover, brown skin cools more rapidly than white skin. On this account, as well as for other reasons, tanning of the white skin is beneficial and the lack of it is doubtless, in part, a cause of the poor adaptability to heat which the white woman who lives indoors or carefully guards her complexion usually displays.

I have spoken about brown skin absorbing heat. What really happens is that the light rays pass through the cutis till they strike the pigment layer where they are converted into heat. In the case of the white skin the light rays pass right through and the conversion into heat takes place as the result of the action of the blood pigment. A thin skin is a useful asset in promoting conduction, for the horny layer is a very bad conductor of heat. The brown or black man, protected by his pigment, does not require a thick, horny layer, but it is significant that Priestley [15] has noted a coarsening of the skin of white women in tropical Australia. Had these women done field work their skins might have become tanned instead of thickened. Of two evils it were well to choose the lesser. Persons who do not perspire or who have a defective sudorific system are unsuited to residence in the tropics, and in the case of prospective settlers inquiry should always be made on this point. A defect of this kind may be transmitted to the offspring.

RESPIRATORY EXCHANGE.

Little need be said about respiratory exchange. The lungs, which by the evaporation of water from them aid the cooling process, weigh less in hot than in cold or temperate climates, because the place of the blood which passes to the warm body surface is taken by air. Pulmonary capacity is therefore increased, but the lessened number of respirations preserves the necessary balance. In the tropics the air which is inhaled is rarefied by heat and so contains less oxygen than cold air. The respirations being reduced in number and less oxygen inspired, less carbonic acid and water vapour are given off by the lungs. As a result there is a tendency to the retention of carbonaceous matter in the blood. So far as I can discover, no ill-effects have been attributed thereto, but it is conceivable that it may tend towards fatigue. Young[12] and his co-workers showed that the alveolar air at rest in inhabitants of tropical Queensland exhibited a lower carbon dioxide content than the European average.

BLOOD.

The blood is the life, and, as might be expected, numerous observations have been made in various parts of the world on the blood state of Europeans in the tropics. It is possible that they began with those of Mayer carried out at Java in 1840, when on bleeding his patients he noticed that their venous blood was much redder than he had found it when venesecting in Germany. His deductions from this phenomenon, however, concern basal metabolism, and will be considered later. There is some doubt as to whether climate alone can produce any change in the formed elements of the blood. There is no certain evidence that it produces anæmia, the pallor of old tropical residents being merely skin deep, due to a local vasomotor condition, a cutaneous ischæmia, as Musgrave and Sison[16] maintain. Certainly, so far as the Philippines are concerned, Chamberlain[17] has shown that the blood of white men after a year or more of residence is well up to standard. On the other hand, Mitchell,[18] a British naval surgeon, declares that the damp heat of the Persian Gulf produced a simple but severe anæmia in cases under his care. Unfortunately, he gives no blood counts, although he states that the blood was examined. His conclusions are not convincing.

It is possible that climate may produce changes in the hæmoglobin. Thus Plehn,[19] working in the Cameroons, found evidence of hæmoglobinæmia, while Gibbs,[20] in Manila, showed that ultra-violet light can transform oxyhæmoglobin into methæmoglobin. According to Harston[21] the blood of children in the tropics shows a diminution in the percentage of hæmoglobin, though the red cells are increased relatively to the fluid elements of the blood, because the latter is more concentrated owing to excessive perspiration. He considers the lessened hæmoglobin content to be due to: (1) The fact that heated air contains less oxygen per cubic foot than cool air; (2) the slower respiratory exchange to which reference has already been made; (3) the depletion of blood in the lungs which has also been mentioned.

Some sound work was carried out not long ago by Kop,[22] who, at Weltevreden in Java, investigated the blood of 93 normal healthy individuals—55 Europeans and 38 natives. The blood counts were made on films taken with due precautions before 9 o'clock in the morning from subjects with empty stomachs. In each case the red and white corpuscles were enumerated, the hæmoglobin index was determined, a differential leucocyte count performed, and the Arneth index noted. No difference of any kind was found between the blood of these people and that of dwellers in temperate climates, save that the natives had eosinophilia, doubtless due to infection with intestinal worms. Elsewhere a shift to the left in the Arneth count has been described, possibly indicating a lowered resistance to disease, but the records are not very satisfactory, and in all likelihood Kop's results are generally applicable. The lymphocytosis which has occasionally been observed is probably a pathological symptom not due to climate. It must, however, be noted that observations in the Egyptian deserts by Bickel, Loewy, and Wohlgemuth,[23] and amongst the Djerids of South Tunis by Grober[24] have conclusively shown that under the peculiar climatic conditions obtaining in these regions there is an increase in the erythrocytes and hæmoglobin. It has been suggested that the peculiar and intensive light conditions prevailing in the desert stimulate the blood-forming organs, just as experimentally the light of a mercury lamp induces in them a fresh activity resulting in red cell increase. It is conceivable that such a stimulant action mitigates the ill-effects of

OPEN-AIR TREATMENT OF SURGICAL TUBERCULOSIS.

A VISIT TO ALTON.

THE vice-presidents, companions, and local honorary secretaries of the Queen Alexandra League were entertained by Sir William Treloar at Alton, Hants, on July 4th, on the occasion of the visit of Sir Clifford Allbutt. Sir William Treloar, before introducing Sir Clifford Allbutt, stated that the League was founded 17 years ago by Queen Alexandra for the purpose of collecting money for the Lord Mayor Treloar Cripples' Hospital and College, and during last year had raised over £9000.

Address by Sir Clifford Allbutt.

Sir Clifford Allbutt, after expressing his great pleasure at having this opportunity of seeing the remarkable work in progress at Alton, quoted Sir Anthony Bowlby as saying that the glory of Alton had abated surgery and that the old treatment of excision of joints had passed into oblivion. He gave a brief outline of the progress of medical knowledge in respect to tuberculosis, recalling the coddling treatment of this disease when even the keyholes were stuffed with cotton-wool in order to lessen the possibility of a draught reaching the patient. Tuberculosis, spread by infection, was a general disease, therefore local excision was not the best treatment. The value of open air, good food, and above all sunlight as means to increase the natural resistance was very potent. He stressed the importance of precise dosage and careful distribution in sunlight treatment in order that perils should be avoided and successes won. From Hippocrates onwards the law of reciprocal action, the ability of Nature to hit back, had been continually demonstrated. The intrinsic natural reaction of the individual was often strong enough to withstand infection. Open air increased the fortifications of the physiological reactions and replaced natural exercise in keeping the patient healthy. Alton was fortunate in having a pavilion with 50 beds at Hayling Island. Sir Clifford Allbutt paid a tribute to Rollier for his work in heliotherapy and occupation therapy; at Alton 14 teachers and four technical instructors were employed to keep the patients happily occupied. To the importance of early treatment and the value of following up cases after discharge he largely attributed the successful results, exclusive of accidents, in 95 per cent. of the cases sent to Alton. Sir Clifford Allbutt concluded by stating the two modern events which had given him the greatest pleasure—the remarriage of surgery with internal medicine after their long divorce, and the formation of an institute of comparative medicine at Cambridge.

The Work at Alton.

The work at Alton is too well known to need detailed description. Amongst its many interesting features may be mentioned the observation ward where each new patient admitted is kept for a period of at least a fortnight in quarantine. Each child occupies a separate cubicle and during his stay the case is worked up, his educational standard ascertained, X rays taken, and necessary splints manufactured. After that the patient is warded—or rather gradually acclimatised to open air and sunlight—not according to age or medical classification, but according to his standard of intelligence and school class. Non-inflammable perforated celluloid plasters and various splints and methods of extensions invented at Alton are in use with remarkable results. The difference in degree of pigmentation was considerable, every child having an individual reaction to sunlight. The red-haired, much freckled white-skinned type are unable to tolerate exposure and have consequently a less hopeful prognosis. The beds in the "*Hampshire*" ward are heated electrically, Alton being the first hospital to adopt this method. In sharp contrast to cases of surgical tuberculosis as seen in a general hospital or out-patient department is the total absence of muscular wasting. This is attributed to the action of open air on the skin—a loin cloth and sun hat is generally the only covering. The effect of fresh air on naked skin has been proved by Dr. Leonard Hill, Dr. Argyll Campbell, and Sir Henry Gauvain to increase greatly the metabolism of the body. It is stated that the pigmented patients at Alton, even though suffering from surgical tuberculosis, have their working capacity increased on an average by 37 per cent. beyond that of normal healthy children.

Alton is a striking example of what a hospital, situated in ideal country surroundings, supplying its own vegetables, fruit, pigs, and eggs can do for its patients.

MEDICINE AND THE LAW.

LIABILITY FOR IMPURE WATER-SUPPLY.

AFTER litigation extending over two years the High Court of California, U.S.A., has recently awarded substantial damages, to be paid by the city authorities, to 19 persons who contracted typhoid fever at Pittsburgh, in consequence of a breakdown in the apparatus for purifying the city's water-supply. This is drawn from the Sacramento river, the water of which is recognised as unfit for drinking until properly treated, and at a date preceding the outbreak of typhoid, from which the plaintiffs suffered, the chlorinating plant was for a time inoperative owing to the fixtures upon a drum containing chlorine gas not permitting of its attachment to the pumping system until the necessary alteration of the fittings had been made. The court has held that an obligation lies upon the city authorities who distribute the water to use all reasonable precaution to render it fit and wholesome. Presumably, in terms familiar in our courts, the judgment was to the effect that there was negligence in not securing a supply of chlorine gas in a receptacle suitable for use in the machinery installed for the purpose, and in allowing water to be supplied in a condition known to be unsafe, and without warning to the public. Subject to any special provision not likely to be inserted in any water company's Act, there can be no reason why such an action should not lie in this country in similar circumstances.

AUTHORITY TO ENGAGE AN AMBULANCE.

At Romford County Court recently his honour Judge Crawford tried an unusual action, in which the Romford Urban Council sued a Mr. Thwaites for payment for the use of the town ambulance to convey him to a London hospital. Mr. Thwaites denied liability and said that he could have travelled by omnibus or similar conveyance, and that the ambulance had been ordered by his medical attendant, Dr. V. Levy, without his authority. Accordingly the Council had joined Dr. Levy as a defendant and he was represented at the trial by Mr. H. F. Dickens, briefed by the solicitor to the Medical Defence Union. As to the main facts there was no dispute. Dr. Levy had attended Mr. Thwaites, who was suffering from severe abdominal pains, and on receiving a second summons decided that the case was one of urgency, and accordingly, on his way to his *patient's house*, asked for an ambulance to be sent at once to take him to a hospital. He told the court that he would have been running a great risk if he had allowed any delay to occur. On Mr. Thwaites saying that he could have travelled in an omnibus or tram-car Judge Crawford asked, "Don't you think that the doctor was the best judge of that?" In giving his decision, Judge Crawford compared the case to that of the captain of a ship who when out of reach of his owners had to come to a decision and take responsibility *on their behalf*. A doctor in a similar case of great urgency became, in his opinion, an "agent by necessity" and was fully justified in taking whatever steps he might think necessary in his patient's

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(This lecture will be concluded in a coming issue.)

NATIONAL BABY WEEK CONFERENCE.

(Continued from p. 33.)

The subject under discussion on the morning of July 3rd was the

Scope, Staffing, and Administration of an Infant Welfare Centre,

the points for consideration being well set out in an introductory speech by Mr. H. O. Stutchbury, the chairman. In regard to staff, the Ministry of Health had an open mind as to the relative values of a whole-time medical officer appointed by the local authority, a specialist in child welfare, and a general practitioner, always provided that the doctor had special knowledge of children's health. A medical officer doing nothing but children's work was apt to suffer from monotony, and there was, he thought, little to be said in favour of a rota of doctors, as continuity in advice and treatment must necessarily be lost.

Dr. W. G. Willoughby considered that it came within the scope of a welfare centre to procure or provide medical treatment for cases in which treatment was unlikely to be obtained otherwise. If the medical part of child welfare was universally carried out by private practitioners, the centres could confine themselves to dealing, at most, with minor ailments; at present this was not the case, and many children would remain untreated but for the work of the centres. The scope of the welfare centre was to fill any gap in the measures for preventing suffering to children, even if temporarily it ran up against other interests. An experienced medical chief was the first essential of a satisfactory staff, but Dr. Willoughby also placed great importance on highly trained health visitors for the homes. In Eastbourne the service of home helps had been found invaluable.

Dr. Mabel Brodie said there were three sides to the work—educational, medical, and social—and the first and last could be carried out by competent volunteers. Talks should be given, where possible, on health, sanitation, psychology, mothercraft, and housecraft, and in some cases such subjects as gardening and poultry-keeping might be included. It was desirable that where special home treatment was recommended, it should be demonstrated at the centre. Many mothers had no idea how to make a poultice or administer an enema. Often there was no district nurse to show them, and the health visitor had not time. People going into the newer type of house required instruction as to the respect due to the bath and sanitary arrangements, if these are to be kept in working order. Dr. Brodie would like the centres to be in the nature of mothers' clubs rather than out-patient departments, and to provide reading and rest rooms, and, where possible, a bath, which would be greatly appreciated by the mothers. The medical side should be preventive, but we had not reached that ideal at present, and minor dressings at least should be done at centres in places where there was no district nurse. Efficient medical officers were a necessity; whether male or female, it was essential that they should love babies, understand mothers, and be acquainted with the social affairs of the district.

Dr. E. Rowland Fothergill (representing the British Medical Association) said it was necessary to distinguish clearly between the centre and the clinic. The object of the centre should be educational and advisory, and medical treatment should not be given for any condition which, in the absence of the centre, would be recognised as calling for a doctor's attention. Mothers or children requiring medical treatment should be referred to the family doctor or, where there was no family doctor, to the clinic. The general practitioner was the pivot and anchor of the people's health, and every means of education and experience should be placed at his disposal.

Dr. Harold Scurfield said it sometimes seemed to be thought that babies and disease were invented for the benefit of the medical profession. The important thing was to get the necessary treatment and cure; it was useless to search out disease unless it was to be followed up by treatment. The panel system dealt with the worker, but there was at present no medical service at the disposal of the family.

The question of the advisability in urban areas of combining the functions of health visitor with those of other officers led to the expression of views on the whole more in favour of unification than against it.

Dr. W. E. Hope (M.O.H. Liverpool), in a paper read in his absence by Dr. S. G. Moore, gave some account of the evolution of public health work in Liverpool, and laid down the principle that certain preliminary training and experience were required for all health visitors, who, with this background, could readily assimilate special instruction to fit them for other branches of work.

Dr. F. E. Wynne thought the same tests in regard to specialisation ought to be applied as in medicine or surgery. In both cases the worker needed to have a sound knowledge of the whole field first, and then the particular section chosen should be sufficiently wide to occupy the whole energies of the specialist. It was almost impossible to avoid some overlapping while different branches of public health work were under separate Government departments.

In the final session on

Housing in Relation to Infant Welfare

Dr. Marion Cockerell gave a moving picture of the tenement house as she knew it in the borough of St. Pancras. It was common for a whole family to live in one room, and in most tenement houses there were no conveniences. Cooking had usually to be done on an open fire, and there was one sink, one w.c., and one dustbin for the whole house, all of which were only as clean as the least clean inhabitants. A house might be healthy as a whole, and yet people in certain rooms might be living in bad conditions. Those in the basement got no sunshine, and the babies showed poor resistance to disease of any kind. There were two possible remedies: first, to build new houses, self-contained and easy to keep clean; and secondly, to help some of the population to move into the country and live, not in mere suburbs, but in garden cities.

OPEN-AIR TREATMENT OF SURGICAL TUBERCULOSIS.

A VISIT TO ALTON.

THE vice-presidents, companions, and local honorary secretaries of the Queen Alexandra League were entertained by Sir William Treloar at Alton, Hants, on July 4th, on the occasion of the visit of Sir Clifford Allbutt. Sir William Treloar, before introducing Sir Clifford Allbutt, stated that the League was founded 17 years ago by Queen Alexandra for the purpose of collecting money for the Lord Mayor Treloar Cripples' Hospital and College, and during last year had raised over £9000.

Address by Sir Clifford Allbutt.

Sir Clifford Allbutt, after expressing his great pleasure at having this opportunity of seeing the remarkable work in progress at Alton, quoted Sir Anthony Bowlby as saying that the glory of Alton had abated surgery and that the old treatment of excision of joints had passed into oblivion. He gave a brief outline of the progress of medical knowledge in respect to tuberculosis, recalling the coddling treatment of this disease when even the keyholes were stuffed with cotton-wool in order to lessen the possibility of a draught reaching the patient. Tuberculosis, spread by infection, was a general disease, therefore local excision was not the best treatment. The value of open air, good food, and above all sunlight as means to increase the natural resistance was very potent. He stressed the importance of precise dosage and careful distribution in sunlight treatment in order that perils should be avoided and successes won. From Hippocrates onwards the law of reciprocal action, the ability of Nature to hit back, had been continually demonstrated. The intrinsic natural reaction of the individual was often strong enough to withstand infection. Open air increased the fortifications of the physiological reactions and replaced natural exercise in keeping the patient healthy. Alton was fortunate in having a pavilion with 50 beds at Hayling Island. Sir Clifford Allbutt paid a tribute to Rollier for his work in heliotherapy and occupation therapy; at Alton 14 teachers and four technical instructors were employed to keep the patients happily occupied. To the importance of early treatment and the value of following up cases after discharge he largely attributed the successful results, exclusive of accidents, in 95 per cent. of the cases sent to Alton. Sir Clifford Allbutt concluded by stating the two modern events which had given him the greatest pleasure—the remarriage of surgery with internal medicine after their long divorce, and the formation of an institute of comparative medicine at Cambridge.

The Work at Alton.

The work at Alton is too well known to need detailed description. Amongst its many interesting features may be mentioned the observation ward where each new patient admitted is kept for a period of at least a fortnight in quarantine. Each child occupies a separate cubicle and during his stay the case is worked up, his educational standard ascertained, X rays taken, and necessary splints manufactured. After that the patient is warded—or rather gradually acclimatised to open air and sunlight—not according to age or medical classification, but according to his standard of intelligence and school class. Non-inflammable perforated celluloid plasters and various splints and methods of extensions invented at Alton are in use with remarkable results. The difference in degree of pigmentation was considerable, every child having an individual reaction to sunlight. The red-haired, much freckled white-skinned type are unable to tolerate exposure and have consequently a less hopeful prognosis. The beds in the "Hampshire" ward are heated electrically, Alton being the first hospital to adopt this method. In sharp contrast to cases of surgical tuberculosis as seen in a general hospital or out-patient department is the total absence of muscular wasting. This is attributed to the action of open air on the skin—a loin cloth and sun hat is generally the only covering. The effect of fresh air on naked skin has been proved by Dr. Leonard Hill, Dr. Argyll Campbell, and Sir Henry Gauvain to increase greatly the metabolism of the body. It is stated that the pigmented patients at Alton, even though suffering from surgical tuberculosis, have their working capacity increased on an average by 37 per cent. beyond that of normal healthy children.

Alton is a striking example of what a hospital, situated in ideal country surroundings, supplying its own vegetables, fruit, pigs, and eggs can do for its patients.

MEDICINE AND THE LAW.

LIABILITY FOR IMPURE WATER-SUPPLY.

AFTER litigation extending over two years the High Court of California, U.S.A., has recently awarded substantial damages, to be paid by the city authorities, to 19 persons who contracted typhoid fever at Pittsburgh, in consequence of a breakdown in the apparatus for purifying the city's water-supply. This is drawn from the Sacramento river, the water of which is recognised as unfit for drinking until properly treated, and at a date preceding the outbreak of typhoid, from which the plaintiffs suffered, the chlorinating plant was for a time inoperative owing to the fixtures upon a drum containing chlorine gas not permitting of its attachment to the pumping system until the necessary alteration of the fittings had been made. The court has held that an obligation lies upon the city authorities who distribute the water to use all reasonable precaution to render it fit and wholesome. Presumably, in terms familiar in our courts, the judgment was to the effect that there was negligence in not securing a supply of chlorine gas in a receptacle suitable for use in the machinery installed for the purpose, and in allowing water to be supplied in a condition known to be unsafe, and without warning to the public. Subject to any special provision not likely to be inserted in any water company's Act, there can be no reason why such an action should not lie in this country in similar circumstances.

AUTHORITY TO ENGAGE AN AMBULANCE.

At Romford County Court recently his honour Judge Crawford tried an unusual action, in which the Romford Urban Council sued a Mr. Thwaites for payment for the use of the town ambulance to convey him to a London hospital. Mr. Thwaites denied liability and said that he could have travelled by omnibus or similar conveyance, and that the ambulance had been ordered by his medical attendant, Dr. V. Levy, without his authority. Accordingly the Council had joined Dr. Levy as a defendant and he was represented at the trial by Mr. H. F. Dickens, briefed by the solicitor to the Medical Defence Union. As to the main facts there was no dispute. Dr. Levy had attended Mr. Thwaites, who was suffering from severe abdominal pains, and on receiving a second summons decided that the case was one of urgency, and accordingly, on his way to his patient's house, asked for an ambulance to be sent at once to take him to a hospital. He told the court that he would have been running a great risk if he had allowed any delay to occur. On Mr. Thwaites saying that he could have travelled in an omnibus or tram-car Judge Crawford asked, "Don't you think that the doctor was the best judge of that?" In giving his decision, Judge Crawford compared the case to that of the captain of a ship who when out of reach of his owners had to come to a decision and take responsibility on their behalf. A doctor in a similar case of great urgency became, in his opinion, an "agent by necessity" and was fully justified in taking whatever steps he might think necessary in his patient's interest. Ambulances were modern inventions to secure the safe conveyance of patients, and though he knew of no parallel case, the principles of the common law would apply. If the man had died he had no doubt that his relatives would have blamed the doctor if he had not taken proper precautions. Such cases must often arise, but the question of payment had not before been contested by the patient. The defence was one of the most discreditable he had ever known. He agreed that the matter was of great interest to the general public and to the medical profession, and in giving judgment with costs against Mr. Thwaites for the amount claimed by the Urban Council, he ordered him to pay Dr. Levy's costs and certified for the costs of counsel who appeared for him. Dr. Levy is to be congratulated and also the Medical Defence Union, who no doubt will record the case as a valuable precedent for the application of the law of "agent by necessity" in medical matters.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Treatment of G.P.I. by Inoculation of Malaria.

INTEREST has been aroused by a further communication made to the Vienna Neurological Society by Prof. Wagner-Jauregg, dealing with the results of treating 300 severe cases of general paralysis of the insane by infecting them with tertian malaria. In 1890 Prof. Wagner-Jauregg produced a "curative" febrile condition in such patients by inoculating old tuberculin (Koch). Cases were taken without selection, and it was apparent that the febrile cases had a better expectation of life. He then combined the tuberculin treatment first with mercurial treatment, later with salvarsan, and the results were comparatively satisfactory. In 1909 a report on these results was given at the International Medical Congress in Budapest; some of the patients referred to in that report are still alive and actively working. Of the total number of 86 cases, 23, or 27 per cent., could be classified as having regained full fitness for work; 50 per cent. had lasting remissions. Early cases had better chances of recovery than inveterate cases. Improved results were obtained by the use of polyvalent typhoid vaccine (Besredka), which produced more lasting febrile attacks, and remissions after its use were decidedly longer. Wagner-Jauregg noted that an intercurrent infectious disease, occurring in such patients when they were under the influence of tuberculin or typhus vaccine, produced a definite cure. In 1917 he resolved to infect such patients with the plasmodium of tertian malaria. Nine patients were taken as a first experimental group; of these, 6 are at present (i.e., six years later) perfectly well and fit for work; three had long periods of remission. Having kept this first group under observation for two years, Wagner-Jauregg then conducted large-scale experiments, and his clinic now contains records of over 300 cases treated in this way. The method seems to be the most successful of all known and is applied as follows: Tertian plasmodia obtained in vivo are injected intravenously; an incubation period of 8–14 days follows, and then comes the typical attack. The patient is allowed to undergo 8–10 attacks of fever, and quinine sulphate is then given in the orthodox way; this treatment is followed up by neo-salvarsan injections, which have lately been combined with cerebro-spinal drainage. In 1920 a series of 25 cases, with 9 complete cures, was demonstrated at the meeting of German natural scientists at Nauheim. In 1922 the number had gone up to 294 cases, with 112 complete cures, and 88 long remissions (reported at Leipzig). The improvement is noted some time after the fever treatment; it continues to increase gradually until a full remission is observed. It was found possible to transform an incomplete remission into a complete one by repeating the whole series of treatment. Reports of observations of the same nature have come from numerous other places—e.g., Graz, Heidelberg, Göttingen, and Munich. Another important observation has been made by Prof. Kyrle (assistant of Prof. Zinger) on the treatment of secondary manifestations of syphilis by injection of tertian malaria with very satisfactory results. The experiments are not yet concluded, the time being still too short for definite conclusions to be drawn, but there seems reason to envisage the possibility of radical cure of syphilitic infections by combined malaria-salvarsan treatment.

Closing of All Schools for Dental Mechanics.

By an order of the Board of Health the existing schools for technical dentistry open for non-medical pupils will be permanently closed at the end of the summer term. This is the final result of the "Dental Mechanics Act," introduced in July, 1920, by which all dental work in the mouths of patients is handed over to medical men only. The dental mechanic will in future only serve as an apprentice or qualified workman in the workshop of a dental surgeon; instruction in technical dentistry will be obtainable exclusively in dental clinics, open only to doctors of medicine. The non-medical dentists at present practising will retain their position, which will even be a little extended in so far as they are permitted to extract teeth and to fill and treat diseased roots. The apparatus of the once famous Dental Mechanics School of Vienna will be handed over to the Vienna Dental Clinic. The Act also terminates dental practice under titles such as "doctor of mechanical dentistry" and "licentiate of dentistry" obtained abroad.

Vaccination Against Measles.

At a recent meeting of the Vienna Medical Society a report from the "Mautner Markhof Children's Hospital," presented by Prof. Leiner, recorded results obtained by the method of Dr. Degkwitz, of Munich, of vaccination against measles. This disease has a tendency to become very dangerous every third year, especially with children below the age of one year. In the 1919–20 epidemic older children were also frequently fatally affected, and in 1922–23 the winter season was again accompanied by severe mortality, particularly in several children's hospitals. Dr. Degkwitz took 60–80 g. of blood from children in the convalescent stage of measles and prepared from it a serum, of which 3 c.cm. were injected intramuscularly into children in direct contact with measles patients. The earlier this prophylactic immunisation took place the better were the results seen. If set up on the second to the fifth day after contact it was still efficacious, being less protective on the sixth to the eighth day, although even then the course of the disease was mild and transient. The control experiments conducted in Vienna have fully confirmed the claims made at Munich, and the serum will be manufactured in large quantities for use in private practice.

Prophylactic Inoculation of Dogs Against Rabies.

In my letter of June 13th[1] a paragraph referred to anti-rabies measures in Austria. The following information may now be added. Prophylactic inoculation of dogs against rabies has been undertaken in Vienna; of 90 animals inoculated according to Pasteur's method, and then subjected to an "experimental" bite by a diseased animal, not one developed rabies. There is a growing desire among the public for general anti-rabies inoculation of the dog population. Four injections of vaccine on four consecutive days would, it is estimated, cost 30,000 kroner (2*s.*).

Autumn Post-Graduate Courses.

The Medical Faculty of Vienna will hold a post-graduate course for Austrian and foreign practitioners from Sept. 17th–29th. Lectures will be as follows:—Sept. 17th: Errors in Diagnosis of Diseases of the Eye; Diagnosis and Treatment of Trachoma; Cataract; Strabismus.—Sept. 18th: Vertigo; Pain in the Study of Otology; Important Surgical Indications in Diseases of the Ear; Deafness; Tonsillectomy.—Sept. 19th: Traumatic Neuroses; Diagnosis of Early Progressive Paralysis; Treatment of Progressive Paralysis; Psycho-analysis.—Sept. 20th: Tuberculosis in Children; Stridor in Children; Parasitic Worms in Children; Differential Diagnosis of the Exanthemata.—Sept. 21: Deficiency Diseases; Albuminuria in Children; Syphilis Neonatorum; Advice to Mothers.—Sept. 22nd: Prevention of Goitre; Modern Cardiac and Vascular Remedies; Diseases of the Liver; Disorders of Metabolism.—Sept. 24th: Diseases of Internal Secretion; Tuberculosis of the Lungs; Heart Disease; Intestinal Diseases.—Sept. 25th: Distinction Between Obstetric Indications in the Clinic and in Private Practice; the Possibility of Restoration of Function by Operation in Gynæcology; "Hormone-therapy" in Gynæcology and Obstetrics; Causes of Danger to the Child During Pregnancy and Birth; the Relation of the Special Sense-Organs with the Genital Organs in the Female.—Sept. 26th: Indications for and Success of Radiotherapy in Gynæcology; New Methods of Examination in Gynæcology and Obstetrics; Metritis, Endometritis, and Uterine Disorders; Gonorrhœa of the Uterus; Urology for the Practitioner; Tubal Pregnancy; Delayed After-birth.—Sept. 27th: Modern Treatment of Syphilis; Treatment of Eczema; Radiotherapy; Sexual Offences.—Sept. 28th: Indications for Urgent Operation; Surgical Indications in Diseases of the Biliary Tract; Surgery of Accidents; Surgery of the Mammary Glands.—Sept. 29th: Ætiology and Diagnosis of Intestinal Cancer; Treatment of Fractures by Simple Means. A Clinical Course will follow from Oct. 1st to 6th. Those intending to take the post-graduate course should send name, address, and title to Dr. Kronfeld, Porzellangasse 22, Vienna. Fee for Austrians and Germans, 25,000 kroner; for Bulgarians, Jugo-Slavs, Poles, Russians, Czecho-Slovaks, and Hungarians, 100,000 kroner; for other foreigners, 200,000 kroner. Other courses, beginning on July 2nd, August 1st, or Sept. 3rd, will be held in the following subjects: (1) Anatomy, Medical Chemistry, Physiology, History of Medicine; (2) Forensic Medicine; (3) Internal Medicine; (4) Diseases of Children; (5) Neurology and Psychiatry; (6) Surgery and Orthopædics; (7) Rhino-laryngology; (8) Ophthalmology; (9) Otology; (10) Gynæcology and Obstetrics; (11) Skin and Venereal Diseases; (12) Urology; (13) Radiology.

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[1] THE LANCET, June 23rd, p. 1284.

June 29th.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Death of Dr. Hermann Biggs.

Dr. Biggs became ill on June 2nd in his holiday camp at Little Moose in the Adirondacks. Returning to his home in New York, the State health commissioner never rallied and died on June 28th. The diagnosis of broncho-pneumonia was confirmed by autopsy, for Dr. Biggs had particularly requested his friend, Prof. Ewing, of Cornell University to perform this service. Hermann Michael Biggs was born in Trumansburg, N.Y., on Sept. 29th, 1859. After graduating A.B. Cornell in 1882 and M.D. Bellevue Hospital Medical College in 1883, he studied in Berlin and Griefswald. In 1895 he directed the production of the first diphtheria antitoxin in this country. He has been director of the Rockefeller Institute of Medical Research since its organisation in 1901. In 1900 he became general medical officer of the New York city health department, with which he had then been connected for 12 years. He was instrumental in establishing the New York City bacteriological laboratory, the first municipal bacteriological laboratory in the world, and quickly made a reputation as one of America's leading bacteriologists. He remained with the city health department until 1914. The mortality statistics in New York City underwent a rather startling change during his administration, the general death-rate falling from 18·6 per 1000 in 1902 to 13·78 in 1913. The corresponding rates for the State of New York were 14·4 per 1000 and 15·4 per 1000 respectively. During this period he was largely responsible for formulating and directing the campaign against tuberculosis in New York that was so warmly commended by Koch in 1908, and that has been so successful. In January, 1914, Dr. Biggs was appointed Commissioner of Health to New York State—a post which he had three times previously declined. In this position, as in his former post with the city, Dr. Biggs was not only responsible for a great body of wise legislation, but he showed a wide constructive imagination in his work of popular education. During the war he was a member of the Relief Commission of the Rockefeller Foundation, he attended the international conference at Cannes, which gave rise to the League of Red Cross Societies, and subsequently was, for a short time, medical director of the League. Both the conference and the League secretariat profited greatly from his unusual executive ability.

His life was filled with fruitful and unselfish endeavour—we have listed above only a part of the distinguished services which he gave to his country and to the world. There is no doubt he might have made a fortune by the private practice of his profession. He preferred to spend himself in a cause which even in America is not well-paid, but which, thanks to the fine example of such pioneers as he, is yearly absorbing more and more of the finest minds in medicine.

American Medical Association Convention.

Signs are not wanting that the whole body of the profession is looking more and more towards methods of early diagnosis and prophylactic treatment. Thus the opening address to the A.M.A. Convention, held this year at San Francisco, brought strongly to the attention of delegates that the objects of the Association are to promote not only "the science and art of medicine" but also "the betterment of public health." Dr. R. L. Wilbur, of Stanford University, the president-elect, reminds us that we "can make our particular civilisation secure only by developing and controlling our food-supply and housing, holding aloof our enemies, particularly the microscopic ones, keeping up proper physical standards of individual and group health, and having ideals of service and religion that make life coöperative and wholesome." But while modern civilisation calls for public health legislation and the health supervision of industry, the individuality of the physician must be conserved. "The voluntary association of two men, one giving and one seeking relief, is at the heart of the art of medicine."

The chairman of the Council on Health and Public Instruction announced that a subscription list of 12,800 has already been secured for *Hygeia*, and judging by the high standard which this journal is maintaining—the July number contains an admirable article by Dr. Victor C. Vaughan on Small-pox Before and After Jenner—this circulation must certainly increase.

June 29th.

The Services.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. J. G. Gill retires on ret. pay.

Maj. E. V. Aylen to be Lt.-Col. to complete estabt.

TERRITORIAL ARMY.

General Hospitals: Maj. A. G. Gibson relinquishes his commn. and retains the rank of Maj.

Capt. J. W. Stretton relinquishes his commn. and retains the rank of Capt.

General List: Capt. T. D. Webster resigns his commn. and retains the rank of Capt.

J. D. M. Cardell to be Lt.

TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon Lt.-Col. (Bt. Col.) A. B. Gemmel (retd.), Majs. A. B. Murray and H. M. Fort, Capt. E. P. Minett (ret.), and Capt. and Qr.-Mr. N. Greenwood.

SMALL-POX IN GLOUCESTER.

STATEMENT BY THE MINISTRY OF HEALTH.

IN view of the public attention attracted by the outbreak of small-pox at Gloucester, the Ministry of Health has issued a statement to the following effect.

Origin of the Outbreak.

The outbreak at Gloucester was not dealt with as soon as it might have been, because of the refusal of the local medical officer of health to admit the presence of small-pox on a large scale in the city. There were, however, admitted cases of small-pox as early as April, and he was advised of the danger by the Ministry of Health early in May on cases of small-pox occurring at places as distant from Gloucester as Liverpool and Abertillery, the source of infection in which was traced to Gloucester. At the end of May, a medical officer of the Ministry of Health, present in Gloucester on a public inquiry, visited various suspected cases reported to him by medical practitioners which he diagnosed as small-pox. The medical officer of health did not agree and Dr. A. F. Cameron, medical superintendent of the M.A.B. Small-pox Hospital at Dartford, was then invited to the city and agreed with the diagnosis of the medical officer of the Ministry of Health. A subsequent house-to-house visitation by officers of the Ministry of Health established the existence of epidemic conditions beyond dispute. The local authority dealt with the situation by entrusting charge of it to Dr. W. H. Davison, senior assistant medical officer of health, Birmingham. A special hospital was set up, special vaccination stations were established, and all contacts were traced as far as possible in view of the time which had been allowed to elapse. While fresh cases are still occurring, the situation is fairly in hand, though there is urgent need of vaccination of the population.

The Present Distribution of Cases.

The table (the figures in which are subject to revision) shows the number of cases of small-pox reported during each of the four weeks ended on June 9th to June 30th in the various sanitary districts of the country.

District.	Week ended June—			
	9th.	16th.	23rd.	30th.
Basford R.D.	3	—	—	—
Bentley-with-Arksey U.D.	—	5	2	1
Heanor U.D.	5	1	4	—
Doncaster Boro'	—	2	—	—
Middlesbrough C.B.	2	—	1	—
Nottingham C.B.	1	—	—	2
Alfreton U.D.	—	—	1	1
Stockton-on-Tees Boro'	4	—	1	—
Clowne R.D.	1	—	1	—
Doncaster R.D.	2	4	10	1
Stapleford R.D.	—	5	—	—
Hereford City	—	—	1	—
Long Eaton U.D.	—	—	5	2
Cheltenham Boro'	1	—	1	—
West Bromwich C.B.	—	—	—	1
Gloucester C.B.	27	51	78	90
Dursley R.D.	—	—	—	1
Gloucester R.D.	—	3	3	—
East Dean and United Parishes R.D.	1	—	4	3
Stroud, R.D.	5	1	—	1
Cirencester U.D.	1	—	—	—
Stroud U.D.	1	—	2	—
Westbury-on-Severn U.D.	—	—	1	—
Cardiff C.B.	5	—	—	1
Lydney R.D.	1	—	—	—
Wheatenhurst R.D.	—	2	—	1
Risca U.D.	—	1	1	—
West Ham C.B.	—	2	—	—
Martley R.D.	—	—	1	—
Warsop U.D.	—	—	15	2
Belper U.D.	—	—	1	—
Birmingham C.B.	—	—	1	2
Kirkby-in-Ashfield U.D.	—	—	6	11
Millom U.D. (suspected)	—	—	—	2
Rhondda U.D.	—	—	—	—
Smethwick C.B.	—	—	—	1
Port of London	—	—	—	1
	60	77	140	131

R.D., Rural District. U.D., Urban District.
C.B., County Borough.

It will be seen that the total number of notifications for these four weeks is 408—as compared with 151 in January, 154 in February, 214 in March, 141 in April, and 112 in May.

Help in Diagnosis.

The particulars given as to the outbreak at Gloucester indicate the dangers of incorrect diagnosis. It is the duty of the general practitioner to notify small-pox to the medical officer of health, and if he is in doubt as to diagnosis he consults that officer. If in his turn the latter has any doubt, he applies to the Ministry of Health and the medical staff of the Ministry at once assists him by advice on the spot as to diagnosis and as to the action which should be taken to stamp out infection locally and prevent its spreading. In view of the number of calls now being made on the Ministry and the limited staff available, arrangements have been made by which medical officers of health, especially expert in small-pox, are ready to give immediate help as required in each of 12 districts into which the country has been divided for this purpose.

Vaccination in Relation to Further Spread.

The statistics show that the incidence of small-pox at present is very widely spread over the country. The number of notifications in the first six months of the present year is largely in excess of the notifications for the whole of last year, and is out of all comparison with the experience recorded since the last epidemic period, 1902–04. In view of the extent to which vaccination of infants has ceased (the percentage of vaccinations for the whole country in 1921 being 38·3 per cent. of births, as compared with 70·9 per cent. in 1907), and in view of the rarity of revaccination among the adult civil population, the Ministry of Health regard the situation with concern and hold the view that there is distinct risk of an outbreak of a serious character. The only practical remedy, now that the infection has been introduced, is increased recourse to vaccination, and the Ministry of Health would urge that this remedy should be made use of as widely as possible. Vaccination can be obtained free of cost by reference to the public vaccinator in the area, who uses lymph of approved quality supplied by the Government Lymph Establishment at Hendon. The reserve of tubes at Hendon is well over a million at present, and can be expanded as required.

MANCHESTER: CARE OF THE BLIND IN THEIR HOMES.—At the annual meeting of the Manchester and Salford Blind Aid Society held at Manchester on July 5th, Mr. E. D. Macgregor, of the Ministry of Health, and other speakers paid a tribute to the society's good work in the care of the blind in their homes. Founded in 1900, the society now accommodates 20 blind men and 20 blind women at the Memorial Home of Rest in Southport, and also gives a holiday there to about 400 blind persons each year; at another home 30 homeless blind women are provided for, and at a third home are 30 more blind of both sexes. According to the latest returns some 35,000 persons in England and Wales are blind within the definition of the Ministry of Health—i.e., so blind as to be unable to perform any work for which eyesight is essential, but it is possible that the actual number is nearer 45,000. Of the 35,000 more than 55 per cent. are over 50 years of age, and approximately 50 per cent. are untrainable and unemployable, blindness in a considerable number of cases being accompanied by other physical or mental defects arising generally from the same cause as produced the blindness. Venereal disease is the largest single contributory cause of blindness, and accounts for 25 per cent. of the cases. There is some reason for believing that the incidence of blindness is declining and it is clear that ophthalmia neonatorum is decreasing. Mr. Macgregor, in outlining the organisation he conceived to be necessary for the blind in a city like Manchester, said that no city in the country was better placed for securing such an organisation than Manchester. The Corporation of Manchester, said Mr. Macgregor, had not so far as he knew yet spent one penny as an authority under the Blind Persons Act, and it was three years since that Act was passed, but there were signs of Manchester moving in the right direction in this work.

Public Health Services.

THE HISTORY OF PUBLIC HEALTH EFFORT IN MANCHESTER.

AN illuminating and suggestive chronicle of the activities of Dr. James Niven. the late medical officer of health, while in the service of the Manchester Public Health Committee. since 1894, is given in a recently published manual,[1] which includes also an account of the work achieved by the committee in so far as Dr. Niven himself had any personal share in it. The chronicle is that of an unfinished task. Dr. Niven would like to see certain branches of public health come under the medical officer of health as coördinating and directing head. notably first the work of the cleansing department, which needs to be directed in subordination to the sanitary requirements of the city, as interpreted by the city's adviser in public health matters. This is equally true with regard to the department which deals with unwholesome foods. The control of infectious disease and the sanitation of schools should similarly, according to Dr. Niven, be placed under control of the medical officer of health, as they originally were, in the same sense as the control of tuberculosis is his responsibility. He believes that by far the most important influence which has governed the improvement of the public health in Manchester, apart from economic conditions, has been the removal of organic filth, whether within or without the habitations of the people. Probably the next in importance has been the control of infectious disease. No less weighty in their effects have been the economic advance of the town and the consequent diminution of poverty, though it is not easy here to trace cause and effect. Much of the bad housing in Manchester is inseparable from the removal of filth. Improvements of a positive character, such as the institution of parks, the physical care and training of children. the provision of public baths and washhouses, have also contributed much to the health of the city. The provision of an abundant and pure water-supply and of a varied food-supply of good quality has also been a factor in health, and the part played by education has not been small.

The annual health reports for the city of Manchester date back to 1868, when Dr. John Leigh was appointed the first medical officer of health, and the city had an estimated population of 345.295. From 1832 until this period the annual death-rate remained at about 32 per 1000. In Dr. Leigh's report for 1869, he records that so numerous were the inhabited cellars in Manchester a few years ago that it might well have been considered a city of cave-dwellers. Under the heading of infectious diseases many practical suggestions are given. Noteworthy are the remarks on "overlooked cases" in scarlet fever, one of the most potent causes of the spread of this disease. Measles is regarded as peculiarly a disease of poverty—that is, in so far as the death-rate is concerned. Tuberculosis, on the other hand, is described as a poverty-making disease, and it is suggested that a high percentage of the existing poverty is attributable to this cause. It may come as a surprise to many that the staff employed in 1921 in the public health department, under the medical officer of health reached a total of 861; included in this total are 215 at Monsall Fever Hospital and 186 engaged in tuberculosis work; health visitors account for 62. maternity and child welfare centres 40. and in the sanitary department 231 persons were employed.

In a final review of the work achieved during his tenure of office Dr. Niven expresses gratitude for the constant support given him by the medical profession, without which no public health service can be successful. On this cordial note does Dr. Niven bring to an end a survey of his stewardship as medical officer of health of the city of Manchester, a survey that may be read with profit by every medical officer of health in Great Britain and beyond.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are the principal health statistics of a group of boroughs of varying size for the year 1922:—

Name of borough.	Estimated population (mid-year).	Birth-rate.	Death-rates per 1000 of population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Halifax C.B. ..	100,500	15·9	14·9	1·1	—	—	112	75	6·2
Warrington C.B.	79,150	22·6	12·1	1·7	0·9	3·2	70	175	2·8
West Bromwich C.B.	76,260	24·1	14·1	0·9	0·8	4·6	86	141	5·5
Guildford B. ..	24,950	17·0	11·6	0·8*	1·4	2·7	40	111	0·0
Leamington B...	28,740	18·0	13·9	1·1	1·3	2·3	58	55	11·6
Shrewsbury B. .	31,240	19·5	13·3	1·5	1·6	3·3	43	138	3·3
Watford B. ..	46,610	19·0	9·6	1·0	0·9	2·3	55	100	3·3
Yeovil B.	15,280	17·6	10·4	1·0	1·6	2·0	53	333	3·7

C.B. = County borough. B. = Borough.
* Pulmonary tuberculosis only.

Halifax.

Dr. Cyril Banks. in reviewing the records of Halifax, points out that the general death-rate and infantile mortality rates are not good, and that the record of deaths of mothers in childbirth for 1920 and 1921 is a sad one. Although infantile mortality has shown a great drop in the last 30 years, there is no decline in neo-natal deaths. and the ante-natal clinic is not yet a success. Dr. Banks unhesitatingly condemns the Goux pail conservancy system, which is still the system in most general use for dealing with human excreta. An effort is being made to do away with tips and to adopt an up-to-date method for dealing with household refuse. An effort is also being made to deal with smoke abatement more effectively, and lectures have been arranged for stokers. A movement has been made towards the avoidance of overlapping (coördination) by employing the health visitors to visit tuberculosis cases. Apparently there is an idea prevalent in Halifax that an untrained woman may conduct the delivery of a midwifery case where a doctor has been engaged. Amongst other needs mentioned by Dr. Banks are properly constructed scarlet-fever wards, and improvements to the public slaughter-house.

Warrington.

Dr. G. W. N. Joseph mentions that, in these days, when economy is so necessary, there is room for a great advance without much expenditure by educating the people in the principles governing health. Housing is still the urgent question; 37 municipal houses were completed during the year, and 36 more were nearly completed. The points considered in allocating municipal houses are overcrowding, expectant mothers. occupation of bedrooms by adults of opposite sexes. husbands forced to live apart from their wives, and tuberculosis. There are still 673 overcrowded applicants on the waiting list. There are also 602 applicants not overcrowded. and 134 who live outside but mostly work in the borough. There is much profiteering among those who let lodgings, so that the lodgers are "taken in" in a double sense. "Unfit" houses cannot be closed.

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[1] Observations on the History of Public Health Effort in Manchester. By James Niven. M.A., M.B., LL.D. Published by the City of Manchester. John Heywood, Ltd. 1923. Pp. 230.

and perineum in all operative cases are painted with iodine before interference. On the district, shaving is not always done on account of the prejudice against it, but it is considered advisable and the keen midwives adopt the practice. At present we provide for each district case, two sterilised pads, and for stitch cases, gauze dressings. If an instrumental case is near enough to the hospital, we send out towels, overalls, pads, and the like. All our midwives are taught to make vaginal examinations in gloves and to deliver in gloves.

With regard to antenatal work, I strongly support Lady Barrett. I have had dental treatment carried out in numerous cases, both at Woolwich and at the Welfare Centre of the Women's League of Service at Hammersmith. Gas is always given for extractions, and I have never known any ill-result. We use every effort to train the midwife pupils to rely on abdominal examination and to avoid vaginal examinations in all cases where the size and position of the head suggest the possibility of a difficult delivery.

The importance of an anæsthetic in the second stage cannot be too strongly urged in order to get full control as the child is born, and to avoid tears and their sequelæ.—I am, Sir, yours faithfully,

MARY A. BLAIR, M.D., B.S. Lond.

Belgrave-road, S.W., July 6th, 1923.

PROTEIN IDIOSYNCRASY AND ASTHMA.

To the Editor of THE LANCET.

SIR,—We have recently had under our care two cases of asthma which we think are of special interest. The first is a sufferer with ten years' history of frequent incapacitation, and the second a man who had his first attack on occupying the room vacated by the first. The suggestion of a connexion between these two events was increased by the discovery that the second man, L., had a positive cutaneous reaction to the protein, for which the first man, K., had received the antigen as a therapeutic measure. As briefly as possible we wish to record the salient features of both cases and the steps in our investigation into their possible relationship.

K. is a man of 29, who for nine years had attacks of asthma at intervals of about a month, with the exception of a period in the summer of 1920, when he enjoyed five months practically without symptoms. The attacks occurred during the night and from four to six nights in succession. They were frequently associated with taking cold; they had appeared to follow the taking of certain fruits, and a psychical element in causation had been noted on an occasion when asthma immediately followed a gasp of admiration on seeing a challenge cup won by comrades. Relief invariably followed the administration of adrenalin, and two minutes after the injection of V $\frac{1}{1000}$ adrenalin solution, the vital capacity had been found to have increased from 300 c.cm. to 1750 c.cm. The bronchial catarrh associated with asthma was always a marked feature, and it usually persisted for several days after amelioration of the bronchial spasm. Severe attacks were associated with a febrile reaction and occasionally herpes of the lips.

In December, 1922, K.'s statement that he thought attacks were induced by taking apples led to an investigation of his protein susceptibility by means of cutaneous reaction. There was no reaction to group proteins for fruits, but there was a positive reaction to organism A. Respiratory tract (streptococcus, staphylococcus, pneumococcus and influenza bacillus). As symptoms and physical signs of simple respiratory infection had accompanied the asthma, K. was then given a series of doses of antigen prepared from this protein, commencing with a dose of five units on Jan. 31st, 1923, and ending with a dose of 1000 units on March 7th. There was a mild attack of asthma during this course, but since its completion there has been no return of bronchial spasm. K. had hitherto shared a room with a friend, A., but while the inoculations were in progress he was accommodated in a ward. On May 7th he returned to his room rejoicing in his newly acquired resistance, only to "catch a cold" and return to hospital on the 18th with a temperature of 101·4° F., respirations 36, and pulse 128. Bronchial spasm was this time not absent, but barely recognisable, while the bronchial catarrh element was severe. Moist sounds appeared in the lower lobes of both lungs, there was copious frothy sputum, and the attack ended as had done former attacks of asthma, normal health being regained on May 25th.

In the meantime, K.'s friend A. changed his quarters, and on May 30th K.'s old room was occupied by two men, L. and G. On June 5th L. had the first attack of asthma of his life. It was mild, but attacks on the succeeding nights were worse, and on the morning of May 9th he was unable to go to work and sought medical aid. He was admitted to hospital with a typical and severe attack of asthma, which quickly improved, and from which he had completely recovered on the 13th. After a week's interval, during which time he had normal health, cutaneous reactions were carried out and L. was found to have a slightly positive reaction to organism A.

Our next step was to investigate the skin reactions of the room-mates of these two men—i.e., A. and G.—and in both cases negative results were obtained. During June 18th, 19th, and 20th, K. and L. were accommodated together in a small side ward. On the evening of the 20th both men were discharged from hospital, and L. returned to the now suspected room, K. entering an adjoining room. On the night of June 22nd–23rd L. had an attack of asthma. This was repeated on the 24th, and on the 25th he was again removed from the room. After June 25th K. and L. have been in close association without apparent ill-effect in either case.

We regret that an urgent demand for side-ward accommodation induced us to terminate the isolation of K. and L. after three days together. L.'s first attack occurred six days after entering K.'s room, and his second six days after meeting K. and three days after re-entering K.'s room. We are, however, inclined to the opinion that his attacks occur rather in the suspected room than in the presence of K. Both patients have had symptoms and signs which, in the past, have led to a diagnosis of pulmonary tuberculosis, but in neither case has the tubercle bacillus been found in the sputum. K. has had attacks in many places, but has always associated certain localities with severe attacks. As described above, a psychical element has been recognised in his case, but it must be noted in this connexion that, as a soldier, he was never prevented from entering or leaving the line by asthma.

The following questions now present themselves: Is K. a carrier of micro-organisms producing a protein to which both he and L. are susceptible? As the room is specially constructed and maintained for the reception of ex-sanatorium patients, it would seem hardly likely that infection could take place after a lapse of 12 days, during which time the room was unoccupied. Are both K. and L. in constant presence of similar organisms but only liable to bronchial spasm under certain undiscovered conditions existing in this room? These are questions which we hope to investigate, but we consider that the unusual and definite nature of the phenomena with which we have come in contact merit their early publication.

We wish to record our indebtedness to Dr. P. C. Varrier-Jones for permission to publish the foregoing notes. We are, Sir, yours faithfully,

L. B. STOTT,
B. R. A. MORTON.

Papworth, Cambridgeshire, July 5th, 1923.

THE LYMPHOCYTOSIS OF INFECTION.

To the Editor of THE LANCET.

SIR,—I suggest that Dr. H. L. Tidy and Dr. E. C. Daniel have, in your current issue, committed themselves to statements which are of a somewhat too comprehensive nature. They record their opinion that "glandular fever and the condition described as infective mononucleosis are identical," and further, that the conception of infective lymphocytosis is based on articles which "reveal no evidence for the statement . . . . . that sepsis is a rare but occasional cause of absolute lymphocytosis." I readily admit that some of the cases brought forward in support of this view were cases of glandular fever, which Dr. Tidy has done so much to establish in its true position as a clinical entity, and that others were cases of leukæmia—e.g., the case of Sanders. But a residuum of cases fails to fit in under either heading, and some of these cases are contained in those articles which are so unceremoniously dismissed.

Cabot has the credit of first calling attention to a condition which he described under the heading, "The Lymphocytosis of Infection." His first case was that of a septic infection of the finger followed by lymphangitis and enlargement of axillary glands. The blood changes are not given in detail, but a statement from Cabot that there was "throughout a well-marked, absolute and relative lymphocytosis" has more value than mere figures. Fever continued for "several weeks," but the patient recovered and was in good health 15 years later. This is not the picture of leukæmia, nor is it that of glandular fever. Yet Dr. Tidy says that "glandular fever and the condition described as infective mononucleosis are identical." There is a further aspect of the question which may be considered—namely, that there exists an infective myelocytosis—e.g., that recorded by Simon[1]—which would appear to bear much the same relation to myelæmia as infective lymphocytosis does to lymphæmia. There are good reasons for supposing that a hyperplasia of the hæmopoietic tissues, comparable to that of leukæmia in all but degree, may complicate various septic conditions, and is further of such frequent occurrence as to be typical in mumps (in early years of life) and in glandular fever.

But it may be doubted whether the recorded cases warrant any more sweeping assertion than this.

I am, Sir, yours faithfully,

Sevenoaks, Kent, July 6th, 1923. GORDON WARD.

TUBERCLE ANTIGENS.

To the Editor of THE LANCET.

SIR,—In your issue of June 30th you draw attention editorially to recent work of Dr. A. R. Jentzer and his fellow-workers regarding the attack on the acid-fast coat of the tubercle bacillus *in vivo*. These workers inject or use a proprietary preparation or compound of fats, lipoids, and waxes. Prof. G. Dreyer, as is well known, removes the fatty and waxy capsule of the tubercle bacillus *in vitro* by formalin-acetone. In both the methods centre on the waxy and fatty protective coat. According to Dreyer, the removal of the acid-fast substances releases the protein antigen. This is thus more readily soluble in trypsin, and after injection is more effective in the production of various antibodies. On the other hand, according to Jentzer and his colleagues, it is claimed that their compound of fatty and waxy substances "stimulate the tissues to produce ferments which not only saponify the fatty and waxy substances introduced by parenteral injection, but also the fatty, lipoid, and waxy constituents of the tubercle bacillus." This method of attacking tuberculosis is described as novel, and in a sense to some extent as anticipating the work of Prof. Dreyer, but the exact composition and mode of manufacture of the compound of the fats, lipoids, and waxy substances used by Jentzer and his colleagues are not published. May I point out that the employment of the fats and lipoids and the theory therefrom constructed is not novel? For many years various aspects of the fat-splitting action of the pancreas has occupied my attention. The results of my work, carried out in the physiological and bacteriological laboratories, King's College, have been published in THE LANCET and elsewhere.[2] The main outcome of this work has been to show that a natural and increased production of lipase in the blood and tissues is an important factor in the protective mechanism of the body. This is particularly the case in malignant disease, although I have pointed out that this lipolytic defensive response is not specific to cancer but is common to tuberculosis and other bacterial invasions. This I have expressed in identically the same terms as employed by Jentzer and his colleagues. Lipase, moreover, lends itself naturally to attacking the fatty and lipoid coat of the tubercle bacillus *in vitro*. As long known, lecithin is split by lipase and accelerates also the activity of that enzyme *in vitro* and *in vivo*. In my experiments it was found that fatty acids are liberated by lipase from killed tubercle bacilli *in vitro*. In this way saponified extracts were prepared and indicated for therapeutic use. Preparations were made also by extracting tuberculous material with the usual fat and lipoid solvents, alcohol, ether, and chloroform successively, in a Soxhlet's apparatus in the usual way, and saponifying the extracted material or emulsifying. This method in the main differs essentially from that of Jentzer and his colleagues in that the *products* of the fats and lipoids of tubercle bacilli are used, together with protein and phosphate derivatives or constituents of the bacillus. The soaps themselves—e.g., sodium oleate, organic and inorganic phosphates, and proteins—have marked power in stimulating tissue lipolytic activity. Similar methods have been employed in dealing with the fats and lipoids of the cancer cell and tissues. The idea or principle underlying treatment by these extracts is stimulation of tissue lipolytic activity with destructive action on the fats and lipoids of the cancer cell, as in the case of tuberculosis, on the fats and lipoids of the tubercle bacillus.

I am, Sir, yours faithfully,

J. A. SHAW-MACKENZIE, M.D. Lond.

London, June 30th, 1923.

DELAY IN GIVING DIPHTHERIA ANTITOXIN.

To the Editor of THE LANCET.

SIR,—All medical officers of health will agree with Dr. F. F. Caiger that frequently in fatal cases valuable time is lost by the practitioner. In 17 fatal cases of diphtheria occurring in Brighton during 1921 and 1922 the time lost by the doctor failing to diagnose the condition is shown in the following table:—

Doctor saw child on ..	2nd	3rd	4th	5th	6th	7th	
Patient had antitoxin on	3rd	3rd	4th	5th	7th	9th	day of illness.
	4th	3rd	4th	6th	—	—	
	5th	3rd	—	—	—	—	
	7th	4th	—	—	—	—	
	15th	5th	—	—	—	—	
	—	5th	—	—	—	—	

There is little doubt from a study of the table that the case mortality of diphtheria can be greatly reduced by prompt diagnosis and immediate removal of the patient to hospital. In Brighton probably one-third of the deaths could have been avoided; assuming the same conditions for the whole of England and Wales the annual loss due to lack of prompt diagnosis by the doctor is some 1800 lives. When one considers that diphtheria in the child is easy to diagnose, also that negative swab results give little help, the folly of awaiting swab results is apparent.

My own conclusions are: (1) It is the duty of general practitioners to acquaint themselves with the easily-grasped *clinical signs of* diphtheria and the duty of those controlling fever hospitals to give opportunity to the general practitioner to see typical cases of the disease; (2) it is doubtful if local authorities should accept swabs for the diagnosis of acute throat conditions in children.

I am, Sir, yours faithfully,

DUNCAN FORBES,
Medical Officer of Health, Brighton.

July 3rd, 1923.

R.A.M.C. MEMORIAL IN DUBLIN.—On July 4th Sir John Goodwin, Director-General of the Army Medical Service, unveiled in St. Patrick's Cathedral, Dublin, a memorial to the officers and men of the Royal Army Medical Corps who fell in the late war. The memorial is a marble tablet, a replica of that erected some months ago in Westminster Abbey. There was a large attendance at the unveiling ceremony.

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[1] Amer. Jour. Med. Sci., 1907, cxxxiii., 389.

[2] Shaw-Mackenzie, J. A.: THE LANCET, 1919, ii., 825; Brit. Med. Jour., 1921, i., 402; Jour. Trop. Med. and Hyg., 1921, xxiv., 161; Med. Press and Circ., 1922, i., 287.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful :—

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

Part I., Physics and Electrotechnics.—Hubert O. Gunewardene, Richard Hayes, and Harold K. G. Hodgson.

Part II., Radiology and Electrology.—Narayan Mahadev Bodas, Lionel R. G. de Glanville, Malcolm Frizell, Hubert O. Gunewardene, William H. Hastings, Richard Hayes, Mahadev Dattatraya Joshi, Anna T. Kellock, Gabriel J. Luyt, Margaret J. Moir, Jessie E. Sheret, Sorab Byramji Warden, and Edward V. Whitby.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful :—

DEGREE OF M.D.

A. V. Campbell and S. M. A. Faruki.

DEGREES OF M.B. AND CH.B. (HONOURS).

Class I.—D. Macfarlane (distinction in Obstetrics and Surgery).

Class II.—F. Earlam and T. J. Kirkpatrick (distinction in Obstetrics), J. Roberts (distinction in Medicine), and A. Tumarkin (distinction in Surgery).

FINAL EXAMINATION FOR DEGREES OF M.B. AND CH.B.

Part III.—B. Abelman, A. R. D. Adams, J. Berkson, R. W. Brookfield, T. L. Bulmer, Hilda Cantrell, W. J. B. Chidlow, R. G. Cooke, V. C. Cornwall, I. H. Davies, Hilda M. Davis, J. O. Edwards, D. P. Finn, N. D. Fraser, J. R. Griffiths, S. Hesselberg, Elizabeth Hunt, T. Knowles, W. J. Laird, D. A. Levin, C. B. Lewis, Eileen M. Lloyd, Mary M. McMillan, P. Malpas, J. H. Moorhouse, Beatrice M. Niven, T. V. O'Brien, C. H. Owen, J. D. O'M. Poole, Gertrude E. Pugmire, E. L. Roberts, Dorothea W. Rogers, J. F. D. Shrewsbury, E. R. Smith, Helen Standring, Dorothy A. Taylor, H. A. Thomas, E. J. Whymark, H. P. Widdup, A. G. Wilkinson, E. B. Wilkinson, J. Williams, and Mary G. T. Williams.

Part II.—B. E. Acland (distinction in Public Health), M. M. F. Arthur, C. B. Bamford, P. D. Barling, E. C. Benn, R. V. Berrington, C. H. Bradley (distinction in Public Health), R. S. Brock, Helen S. H. Brown, Alison M. Brummitt, J. W. Cowen, N. Cresswell, M. M. Datnow, Edwina M. Davies, Eileen N. Deane, W. T. Donovan, W. H. Ellam, W. Emdin, E. A. R. Evans, F. R. Faux, H. W. Fell (distinction in Forensic Medicine and Toxicology and Public Health), H. R. Fisher, M. Fisher, C. G. Foxcroft, F. F. Fuller, G. A. Fulton, G. A. Garrett, J. Gaughan, H. Gobie, M. Godwin, J. Graham, T. A. Griffiths, Dorothy M. Hanson, T. Hare, A. D. Harper, F. C. S. Hinsbeeck, Fannie S. Holt, S. Howard, J. E. Howie, G. P. Huws, Bertha H. Irvine, F. P. Irvine, Elvy I. Johnstone, C. P. Jones, R. W. Jones (distinction in Forensic Medicine and Toxicology and Public Health), R. C. Jones, R. Jones (distinction in Forensic Medicine and Toxicology), D. Katz, G. F. Kinder, J. Leggate, W. E. Lishman, J. H. M. Little, G. Lowe, W. A. McCurdy, G. Macdonald (distinction in Forensic Medicine and Toxicology), Margaret S. Macdonald, E. Miles, D. H. Mills, E. P. Moloney, G. A. Moulden, A. Newton (distinction in Forensic Medicine and Toxicology), J. R. R. Nicholas, J. R. Oddy, J. J. O'Donovan, F. C. O'Mara, A. Oserovitz, E. R. S. Owen, R. D. Owens, A. Pool, R. J. Prydderch, Gwendolen H. ff. Roberts, J. T. C. Roberts, E. Rowlands, E. Scott, J. A. Scott, P. Strelitz, G. V. L. Taylor, A. C. Terry-Thompson, J. H. Thompson (distinction in Public Health), J. J. du Toit (distinction in Forensic Medicine and Toxicology), Marjorie A. Unsworth, H. S. Welton (distinction in Forensic Medicine and Toxicology), T. W. White, and Gwennie Williams (distinction in Forensic Medicine and Toxicology).

Part I.—Mary G. B. Allen, C. G. Foxcroft, T. Hare, A. D. Harper, R. W. Jones (distinction in Pathology), T. S. L. Jones, Rebecca Katz, W. A. McCurdy, J. McWilliams, J. R. Mitchell, F. C. O'Mara, R. D. Owens, P. J. Rogers, J. H. Thompson, and Mabel J. Watterson.

DIPLOMA IN PUBLIC HEALTH.

Doris Brown, Matilda L. Craig, Jeannie P. Dunn T. K. Hughes, W. McMullen, and T. R. Roberton.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations held recently the following candidates were successful :—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology.—Thomas W. May (high marks), Paul H. N. Labuschagne (high marks), William C. Somerville-Large (high marks), Isidore Rosin, James Dick, William Gallaugher, James V. Morris, William B. Roantree, Eric T. S. Rudd, Oliver Chance, William P. E. McIntyre, Thomas G. B. Crawford, William A. Hopkins, Joseph R. Gregory, and O'Donel T. D. Browne.

Part II., Medicine.—Marjorie F. Sibthorpe (high marks), Victor O. McCormick (high marks), Paul J. Grobler, Morris Cohen, Benjamin W. D. Fayle, Francis J. O'Meara, Charles T. MacCarthy, William T. Hogan, William E. Hutchinson, Mossy Jaffe, James E. Deale, Frederick T. Easby, Richard A. D. Pope, William L. Duncan, Isobel G. Smith, Henry M. Martin, Harry Ruben, Harold Lewin, Reginald A. Dench, Richard C. L. Griffiths, Martha Reid, Albert V. Foster, Cecil H. Keller, Solomon Narunsky, Bertha H. Lawler, James J. O'Grady, Frederick G. Brown, Henry W. L. Dale, and Isabella H. Speedy.

Surgery.—Robert T. Jackson (high marks), Benjamin W. D. Fayle, Francis J. O'Meara, Joseph E. Eliason, Joseph A. Gaynor, John M. Mounsey, Marjorie F. Sibthorpe, Richard A. D. Pope, Hyman S. Roseman, Maria E. Wagener, Reginald A. Dench, William S. Dixon, Philipp F. H. Wagner, Bernard Morris, William E. Hutchinson, Wilfrid E. C. Wynne, Arthur Darlington, Asher Asherson, William F. Whaley, Gladys Weatherill, Frederick T. Easby, Dermod H. F. Milmo, Dorothy C. H. Dorman, Lazarus Heyman, Alice M. A. Downing, Robert S. McElroy, Richard C. L. Griffiths, Henry L. Hanna, Rupert L. Hill, James R. Wills, Siegfried D. Gabbe, Joseph C. Byrne, Eric C. Downer, Willem J. Janse van Rensburg, Charles T. MacCarthy, Solomon Narunsky, Pieter C. du Plessis, Charles Gordon, Albert V. Foster, Tobias Freedman, Dorothy I. Henry, Herbert Kohlberg, Israel Marin, Laurence Phillips, Charles R. Hillis, Julius Kruger, Jack A. Levitt, and Joseph M. O'Connor.

Midwifery.—John J. Laing (high marks), Maynard A. Gerrard (high marks), Henry Isaacson (high marks), James E. Deale, William F. Whaley, Rudolf Schaffer, Robert F. J. Henry, William L. W. Smith, Noel G. McAuliffe, Thomas G. Wilson, Gordon Purdy, Gerrard A. Sloan, Wallace R. Aykroyd, Evaline E. Mooney, Lucy M. Joly, James J. O'Grady, Isaac J. Isaacson, Mossy Jaffe, Charles Gordon, Kathleen D. Murison, Norman M. Greeves, Philip P. van der Merwe, Jan Andreas du Toit, Isabella H. Speedy, Jack M. Gordon, James J. FitzGerald, Willem J. Janse van Rensburg, and Robert L. C. Fisher.

DIPLOMA IN PUBLIC HEALTH.

Part I., Chemistry, Bacteriology, Physics, and Meteorology.—Edmund C. Smith and Elizabeth Killian.

Part II., Sanitary Engineering, Practical Sanitary Report, Hygiene and Epidemiology, Vital Statistics, and Public Health Law.—Edmund C. Smith, Dorothy K. M. Henry, Elizabeth Killian, and Catherine A. Goggin.

UNIVERSITY OF MANCHESTER.—The following appointments have been made :—Lecturer in Botany: Mr. John Walton. Lecturer in Bacteriology: Dr. G. Selby Wilson. Assistant Lecturers in Chemistry: Mr. E. L. Hirst and Mr. G. N. Burkhardt.

THE LATE DR. G. L. H. REVILL.—George Leslie Howard Revill, who died on July 6th, received his medical education at Charing Cross Hospital and at Vienna, becoming M.R.C.S. in 1890. He was well-known in Lincolnshire, having a wide practice centred at Heighington, and being very popular alike with his patients and with the members of the many public bodies and friendly societies with whom he held appointments. He was a devout churchman and in politics an ardent Conservative, but he formed enduring friendships with many whose views differed widely from his own. His widow and a son survive him.

ROYAL SOCIETY OF MEDICINE: SECTION OF COMPARATIVE MEDICINE.—On July 6th, under most promising auspices, a new section of this society was formally constituted under the title of the Section of Comparative Medicine, the membership of which is open to duly qualified veterinary surgeons as well as to practitioners of human medicine. Considerable advance has already followed the coöperation of workers on the two sides of medicine, and it is hoped that the constant interchange of views at the meetings of this section will lead to even more rapid progress. The new section, the foundation of which is largely due to the good offices of Prof. F. T. G. Hobday, starts with a strong council, half representing human medicine and half veterinary medicine, with Sir Clifford Allbutt, who has for many years advocated the rapprochement which has now been accomplished, as president. Vice-presidents include Sir Layton Blenkinsop, Lieut.-Colonel J. W. Brittlebank, Sir William Hale-White, Prof. F. T. G. Hobday, Sir William Leishman, F.R.S., Sir John Moore, Sir Leonard Rogers, F.R.S., and Mr. G. H. Wooldridge. Meetings for papers and discussions will be held next session on the fourth Wednesday of each month at 5.30 P.M.

POSTPONEMENT OF THE INTERNATIONAL CONGRESS OF OPHTHALMOLOGY (1925).—The Committee of British Ophthalmologists, appointed to organise an international congress in 1925, finds with regret that it is unable to do so in accordance with the conditions under which the British invitation was accepted by the Washington Ophthalmological Congress in 1922. It will be remembered that at Washington it was decided that the next congress should be strictly international and that German should be one of the official languages. The Committee has since been informed that the Société Française d'Ophtalmologie, the Société d'Ophtalmologie de Paris, and the Société Belge d'Ophtalmologie have passed resolutions to the effect that they feel themselves unable to participate in a congress if Germans are invited. The Committee is of opinion that to proceed with the congress in these circumstances would tend to perpetuate a schism in the ranks of ophthalmology and militate permanently against the progress of the science which all desire to promote. The Committee has therefore reluctantly decided to postpone the congress.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—The annual general meeting of the society will be held at 11, Chandos-street. Cavendish-square, London, W. 1, on July 20th, at 5.30 P.M., when a paper will be read by Mr. Frank Kidd on Vasostomy for Chronic Seminal Vesiculitis (A New Technique).

FELLOWSHIP OF MEDICINE.—A complete course of lectures on medical and surgical diseases of children will be given by all the members of the staff at the Royal Waterloo Hospital from July 16th to August 3rd. In addition to the lecture-demonstrations candidates will have the privilege of attending the out-patient department, wards, and operations. A special course in dermatology will be given by members of the staff at the Hospital for Diseases of the Skin, Blackfriars, from July 16th to the 28th inclusive. Instruction will be given in the out-patient department every afternoon from 2.30 P.M., and a special demonstration on interesting selected cases will be held at 4 P.M. on July 16th and July 25th. The course will also include a venereal clinic on Tuesday and Friday each week from 5.30 to 7 P.M. The fees for these courses are 3 guineas and 2 guineas respectively. Application for copies of the syllabus and tickets of admission should be made to the Secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

SIXTH CONGRESS OF THE SOCIÉTÉ INTERNATIONALE DE CHIRURGIE.—The Congress will be held in London from July 17th to 20th; the scientific sessions will be held at the Royal Society of Medicine, 1, Wimpole-street, W. 1, and the definitive programme is as follows:—July 16th: 2 P.M., meeting of International Committee. 17th: 11 A.M., opening by the Prince of Wales. speeches by Lord Curzon, Mr. Neville Chamberlain. and others. and address by Sir William Macewen (president); 2 P.M., discussion: Surgery of Endocrine Glands (Thyroid excluded). 18th: 9.30 A.M., discussion: Arthroplasty; 2 P.M., operations at hospitals. 19th: 9.30 A.M., discussion: Late Results of Peripheral Nerve Injuries: 11.30 A.M., general meeting: 2 P.M., operations. 20th: 9.30 A.M., discussions: Vaccine and Serotherapy (Tetanus excluded), and Operative Shock; 2 P.M., operations; demonstrations on vaccine-therapy by Sir Almroth Wright at St. Mary's Hospital. Entertainments:—July 16th: Evening reception by the University of London; 17th: evening reception by the President; 18th: official luncheon by H.M. Government for National Delegates; evening reception by the Lord Mayor, Mansion House. 19th: 4–6 P.M., reception by the President of Royal College of Physicians: 9–12 P.M., reception by President of Royal College of Surgeons; 20th: Annual banquet of Society. Secretaries of the Congress. Sir D'Arcy Power and Mr. J. S. H. Roberts (delegate for British Isles).

Mr. Henry Kimpton announces the publication of the following: "The Tonsils: Faucial, Lingual, and Pharyngeal, with some account of the Posterior and Lateral Pharyngeal Nodules," by Dr. Harry A. Barnes (second edition): "Practical Local Anæsthesia and its Surgical Technic." by Dr. Robert Emmett Farr; "Cerebro-spinal Fluid in Health and in Disease," by Dr. Abraham Levinson, B.S. (second edition)' "Tonsillectomy by Means of the Alveolar Eminence of the Mandible and a Guillotine," by Dr. Greenfield Sluder; "Local Anæsthesia in Dental Surgery," by Mr. F. St. J. Steadman, L.D.S. Eng.; "Epidemiology and Public Health: A Text and Reference Book for Physicians, Medical Students, and Health Workers," by Dr. Victor C. Vaughan (vol. ii. ready, vol. iii. in preparation); "Clinics and Collected Papers of St. Elizabeth's Hospital, Richmond, Virginia, 1922"; and "Collected Papers from the Washington University School of Medicine, 1921."

CONDITION OF PRISONS AND INTERNMENT CAMPS IN THE IRISH FREE STATE.—The Free State Government has issued a copy of the report of the International Red Cross Commission on the treatment of prisoners in the hands of the Government. It is stated that the Free State Government welcomed an investigation by an independent and competent body, in view of the propaganda that had been conducted. alleging improper treatment of prisoners. Mr. R. Haccius, a delegate from the Red Cross Commission, visited the principal internment camps in the Free State. He stated that he found the treatment of the prisoners devoid of hostile spirit, and although the Government refused to grant the prisoners the status of "prisoners of war," in reality it treated them as such. Nowhere did he find a wounded or sick prisoner left without medical treatment. On the contrary, he found everywhere a carefully organised medical service. The serious accusations made on this subject appeared to the delegate to be unfounded. He noted that the buildings of the old North Dublin Union were in course of alteration for the reception of the women detained at Kilmainham. and these buildings with the surrounding gardens would fulfil all desirable hygienic conditions. The delegate had instructions to exclude inquiry into individual complaints. He noted that searches had taken place in various private hospitals, but the working of these hospitals had not been interfered with. The complaints regarding sanitary conditions and food in the camps were unfounded. Mr. Haccius then gives a detailed report on the various camps and prisons visited. While satisfied generally with the sanitary conditions, he noted congestion in Mountjoy Prison, where there were in some cases three prisoners in cells which should not hold more than two. He speaks favourably of the medical arrangements everywhere. and noted at the Curragh Camp that "the patients seemed to be very grateful to the doctors for their devoted care and attention."

ROYAL VICTORIA HOSPITAL, BELFAST.—At a meeting of the board of management on July 4th the retirement of Prof. Thomas Sinclair after 38 years' service was the subject of several speeches expressive of the high esteem in which he is held, and of the appreciation by the board of his work as surgeon and teacher. An appropriate resolution was moved by Lieut.-Colonel Mitchell, seconded by the Rev. W. A. Watson, supported by Mr. W. Carson, J.P., and carried with much enthusiasm. The chairman of the board (Prof. J. A. Lindsay) described Prof. Sinclair as one of the pillars of the Royal Victoria Hospital and one of the mainstays of the Belfast Medical School, whose reputation at home and abroad he had done so much to promote and to enhance. Prof. Sinclair is succeeded on the staff by Mr. S. T. Irwin. Mr. H. P. Malcolm was elected assistant surgeon to the hospital.

AN ASYLUM IN INDIA.—The annual statements of the Central Provinces Lunatic Asylum naturally reveal a number of features which are strange to similar work in this country. The hospital accommodates about 400 insane, but the number had to be reduced considerably during the year owing to the scarcity of water. Mania and melancholia are the prevalent types of insanity; no cases of general paralysis. and only one of mental disease attributable to syphilis, were admitted during the year. On the other hand, cannabis indica plays an ætiological part which is unfamiliar to us; tuberculosis appears to be fairly common, and infection with ankylostomes was present in 16 per cent. of the admissions. A radical change in the diet scale has been introduced, and among other improvements which have been sanctioned by Government is the provision of proper accommodation for private patients.

UNIVERSITY COLLEGE, LONDON.—Viscount Chelmsford, chairman of the University College Committee. with Sir Gregory Foster, the Provost of University College, the Deans of the College Faculties, and the tutor to women students, held a reception last Saturday afternoon. July 7th. at which the whole of the College buildings were open for inspection. One object of the reception was to give all old students of University College an opportunity of re-visiting the College and of seeing some of the more recent extensions which have taken place. and in particular the new building for anatomy and the extension of the physiology and pharmacology buildings, forming the Rockefeller Benefaction, opened by the King on May 31st. University College Hospital and University College Hospital Medical School were open throughout the afternoon. About 3000 persons were present. including many headmasters and headmistresses of schools and others connected with various branches of education.

Sir Henry Gray, who is leaving Aberdeen to take up his new post as chief surgeon of the Royal Victoria Hospital, Montreal, was entertained by members of the medical profession to dinner at the Palace Hotel, Aberdeen, on June 27th, Mr. J. Scott Riddell in the chair. In proposing the health of the guest, Mr. Riddell spoke of other Aberdonians who had crossed the Atlantic to professorial chairs in Canada and the United States, and in the course of an eloquent tribute to Sir Henry Gray referred to him as one who would spread the light and enhance the reputation of the medical school of Aberdeen. Sir Henry Gray, in replying. recalled the commencement of his professional work under Sir Alexander Ogston. and his long association with many of those present. He spoke of his long consideration of the invitation to go to Montreal. and of the restlessness, increased by the war. which had helped him to come to his decision. In the light of the nature of his new work. of the environment in which it would be set, and the possibilities of the future in such a progressive place, he felt that it was one of the most desirable positions in the surgical world. Later on in the course of his reply Sir Henry Gray spoke of his great indebtedness to the nursing profession for the very high order of help he had received from them.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, JULY 4TH.

Industrial Diseases.

Mr. D. G. SOMERVILLE asked the Minister of Labour whether, in view of the request for the inclusion of eyesight failure in the Workmen's Compensation Act, his department possessed any reliable record showing how the individual senses were affected by particular industries, and whether in such cases steps were taken to differentiate at any stage between failure due to advancing years and failure due to conditions of work.—Mr. LOCKER-LAMPSON (Under Secretary to the Home Office) replied : The department is in possession of a great deal of information as to diseases and affections which are caused by particular industries and processes, but so far as regards failure of eyesight, such as short-sightedness or other kinds of eye-strain, it would not be possible to differentiate between the effects of the conditions of work, advancing years, and other possible causes.

Viscount CURZON : Does the hon. gentleman's answer apply to the case of railwaymen disabled by injured eyesight? —Mr. LOCKER-LAMPSON : As my noble and gallant friend knows, certain afflictions of the eye are already included under the Act of 1906 and they are being added to.

Skimmed Dried Milks.

Mr. HURD asked the Minister of Health the result of his consideration of regulations for the proper labelling of skimmed dried milks as unfit for children.—Mr. NEVILLE CHAMBERLAIN replied : Draft regulations dealing with this matter have been prepared in my department and I am causing them to be forwarded to the other departments concerned as a preliminary to discussion.

Mr. HURD : Is there any necessity in this matter to consult other countries seeing it is purely a domestic affair of our own ?—Mr. CHAMBERLAIN : So far as I am aware it will not be necessary.

Approved Societies and Voluntary Hospitals.

Sir EDWIN STOCKTON asked the Minister of Health whether, in view of the amount of disposable surpluses of approved societies under the National Health Insurance Act, he would consider the desirability of introducing legislation for the allocation of funds therefrom for the hospital maintenance of insured patients, seeing that such a policy would materially contribute towards meeting the total annual deficiency of the voluntary hospitals.—Mr. NEVILLE CHAMBERLAIN replied : It is open to any approved society having a disposable surplus on valuation to devote the whole or part of such surplus to making payments to hospitals or convalescent homes towards securing the maintenance and treatment therein of members of the society, and out of the surpluses on the first valuation a sum of £979,000 was set aside for this purpose by certain societies in England in respect of the period from July, 1921, to June, 1926. The selection of the additional benefits to be provided by a society for its members rests with the members themselves, and I do not think it desirable that legislation should be introduced to make it compulsory on every society having a disposable surplus to allocate the whole or part of the surplus to any particular additional benefit.

Mr. GERALD HURST asked the Minister of Health whether he was aware of the hardship caused by the disability which now debarred voluntary hospitals from sharing in surplus funds which had accumulated under the National Health Insurance Act, and that the Manchester Royal Infirmary spent about £70,000 a year in maintaining nearly 5000 persons insured under that Act without drawing any substantial contributions from their approved societies ; and if he would consider so amending the law that maintenance and treatment at voluntary hospitals might be included among the additional statutory benefits to be provided from disposable surplus funds.—Mr. NEVILLE CHAMBERLAIN replied : There is no such disability as is mentioned in the first part of my hon. friend's question, and the making of payments towards the cost of the maintenance and treatment of insured persons at voluntary hospitals is already included amongst the additional benefits which may be provided by approved societies from their disposable surplus funds. Such payments are, in fact, being made by a number of societies with a total membership of over 7,000,000 insured persons. The second part of the question does not therefore arise.

Poor-law Midwifery Fees.

Lieut.-Colonel FREMANTLE asked the Minister of Health if he was aware that Poor-law midwifery fees had not been revised since 1847; and whether he would take steps to bring them into line with the fees ruling at present for services of a similar nature.—Mr. NEVILLE CHAMBERLAIN replied : It is true that the Order of 1847 has not been revised, but in a number of cases special arrangements between the guardians and their medical officers as regards midwifery fees have already been approved. I will, however, consider the question of the revision of this part of the order.

Patent Medicines Legislation.

Lieut.-Colonel FREMANTLE asked the Minister of Health if it was proposed to introduce a Bill to give effect to the recommendations of the Select Committee on Patent Medicines, proposals for which were agreed with the parties concerned in 1920.—Mr. NEVILLE CHAMBERLAIN replied : In the present state of business the Government cannot undertake to introduce legislation on this subject during the present session.

Pasteurised Milk.

Mr. ADAMS asked the Minister of Health whether he was aware that, owing to the Milk (Special Designations) Order, 1923, modifying previous orders regarding pasteurisation, it was possible for milk to be sold to the public after having been subjected to repeated heating processes, thus having the major portion of its nutritive value destroyed ; and whether he would take the necessary steps to ensure that such reheated milk should not be retailed to the public or, if so retailed, its exact nature should be indicated.—Mr. NEVILLE CHAMBERLAIN replied : The answer to the first part of the question is in the negative. It is expressly provided in the Milk (Special Designations) Order, 1923, that the milk sold as "Pasteurised" milk shall not be heated more than once. As regards the second part of the question, I am advised that the danger arising to public health from the sale of reheated milk is not such as to justify the issue of special regulations which in present circumstances might result in restricting the supply of milk.

Vaccination and Small-pox.

Dr. CHAPPLE asked the Minister of Health what was the proportion of vaccinated to unvaccinated children of the age of 10 years and under; whether there had been any progressive change in this proportion; and what steps he proposed to take in order to safeguard the population against a possible epidemic of small-pox.—Mr. NEVILLE CHAMBERLAIN replied : It is not possible to state definitely what proportion of the children now living of the age of 10 years and under has been vaccinated. The available statistics show the numbers of children born in each year who were vaccinated within a period expiring at the end of the year following the year of birth. These statistics suggest that the proportion of children now living of the age of 10 years and under who have been vaccinated is not more than 50 per cent. I will send the hon. Member a statement giving the figures for each of the years 1912 to 1921, and showing that the proportion of vaccinations to births has fallen from 50·1 per cent. in 1912 to 38·3 per cent. in 1921. As regards the last part of the question, my department has recently circulated to sanitary authorities and boards of guardians memoranda as to the steps which should be taken on the occurrence of small-pox, and all possible assistance is rendered by medical officers of my department to the authorities of those districts in which an outbreak occurs.

Mr. TREVELYAN THOMSON asked the Minister of Health the average percentage of vaccinations to total births for the last five decennial periods and the number of cases of small-pox per 1000 of the population for the same periods.—Mr. NEVILLE CHAMBERLAIN replied : As regards the first part of the question the percentages of vaccinations to total births in the periods referred to were as follows : 1872–1881, 85·6 ; 1882–1891, 82·2 ; 1892–1901, 68·0 ; 1902–1911, 67·9 ; 1912–1921, 43·4. As regards the second part, particulars as to the total number of cases of small-pox in England and Wales are not available for any year prior to 1911. The number of cases per 1000 of the population for the period 1912–1921 was 0·004.

Replying to Mr. HURD, Mr. CHAMBERLAIN said that he was keeping a close watch upon the situation, and so far as he could see at present there was no need for special legislation.

Mr. THOMSON : Has the right hon. gentleman any information which shows whether the percentage of cases of small-pox has increased relatively to the decrease in the number of vaccinations ?—Mr. CHAMBERLAIN : Yes, undoubtedly.

Viscount CURZON : Has the right hon. gentleman any explanation with regard to the very remarkable drop in the last set of figures which he gave from 67 per cent. to 43 per cent.?—Mr. CHAMBERLAIN : I think that is due to the agitation against vaccination which has taken place in various parts of the country.

Mr. FRANK GRAY asked the Minister of Health whether he had any information indicating that a large number of cases at Gloucester had been wrongly diagnosed by officials of his department, and whether he proposed to take any steps in the matter.—Mr. NEVILLE CHAMBERLAIN replied : The answer to the first part of the question is in the negative, and the second part therefore does not arise.

Mr. SNOWDEN asked the Secretary of State for the Home Department whether his attention had been called to the difficulties put in the way of parents wishing to take advantage of the Vaccination Act, 1907, by magistrates who disapproved of exemption being granted to objectors to vaccination; and whether he would inform all magistrates sitting in open court that they must accept statutory declarations under that Act, whatever their views in respect of vaccination.—Mr. LOCKER-LAMPSON replied: Complaints are occasionally made that individual magistrates refuse to receive declarations, but they have been very infrequent. The Secretary of State has no authority to give the instructions suggested in the last part of the question, but he has repeatedly said that it is the duty of justices to take care that no unnecessary difficulties are put in the way of those desirous of exercising their statutory rights.

THURSDAY, JULY 5TH.

Tuberculosis in Scotland.

Mr. MURNIN asked the Under Secretary to the Scottish Board of Health the number of persons who died in Scotland during 1921–22 from tuberculosis.—Captain ELLIOT replied: The number of deaths in Scotland from tuberculosis was 5737 in the year 1921 and 5818 in 1922.

Small-pox and Chicken-pox.

Major Sir FREDERICK KELLEY asked the Minister of Health whether, in view of the danger that mild cases of small-pox might not be recognised as such, he would consider the issue of a statement instructing parents and others how incipient small-pox may be distinguished from chicken-pox.—Lord E. PERCY replied: My right hon. friend does not consider that the issue of such a statement would be of advantage. It is the function of the medical practitioner in attendance upon a patient to distinguish incipient small-pox from chicken-pox, and the services of the medical officer of health are at his disposal in assisting in the diagnosis of doubtful cases.

Deaths from Small-pox.

Mr. TREVELYAN THOMSON asked the Minister of Health the percentage of deaths to cases of small-pox in each of the last five years, showing separately the figures for those vaccinated and those who had never been vaccinated.—Lord E. PERCY replied: As the protection afforded by vaccination diminishes with lapse of time, I have divided the deaths of vaccinated persons into age groups. The figures are as follow:—

Percentage of Deaths to Cases of Small-pox.

Year.	Vaccinated.			Unvaccinated.
	10 years and under.	Over 10 and under 40.	40 and over.	
1918 ..	—	3·4	3·4	Nil.
1919 ..	—	0·6	3·2	20·8
1920 ..	—	1·5	8·3	13·8
1921 ..	—	—	1·0	1·5
1922 ..	—	0·4	4·1	1·6

Health Absences of School-children.

Mr. EDE asked the President of the Board of Education if he would be prepared to recognise absences of children from elementary schools to receive sanatorium, hospital, or other medical treatment when such absences were ordered by the school medical officer or the medical officer of health as ranking with those specified in paragraph 23 (c) of Schedule 4 of the Code and would allow them to count as attendances under Article 44 (*h*) of the Code, thereby removing an anomaly that became increasingly apparent with the growing vigilance of the school medical service of the country.—Mr. E. WOOD replied: The suggestion made in the question raises points of financial and administrative importance, and I cannot commit myself to reconsider the existing arrangements at the present time.

Pensioners and Medical Treatment.

Mr. ROBERT YOUNG asked the Minister of Pensions what was the number of pensioners who were receiving medical treatment, how many of these were in military hospitals, how many were in general hospitals, how many were receiving home treatment, and of the total number how many were undergoing treatment which prevented them being employed in any occupation.—Major TRYON replied: There are approximately 76,500 officers and men receiving treatment at the cost of my department, of whom about 41,600 are prevented by the treatment from following their occupations. Of the total mentioned, 18 are in military hospitals, 3650 are in general hospitals, and 9300 are receiving home treatment. These figures do not include men receiving treatment, without allowances, from their panel practitioners, of whom I have no record.

MONDAY, JULY 9TH.

Infantile Mortality.

Mr. A. V. ALEXANDER asked the Minister of Health the number of deaths of children for each year from 1914 to 1922, giving separate figures for illegitimate children and covering the ages of under 12 months, over 1 year and under 2 years, and over 2 years and under 3 years respectively.—Mr. CHAMBERLAIN replied: No figures respecting deaths of illegitimate children of 1 to 2 years or 2 to 3 years of age are available prior to 1919, when they were first abstracted. The rest of the required figures are given below:—

Deaths: England and Wales.

—	Under 1 year.		1–2 years.		2–3 years.	
	Total.	Illegitimate.	Total.	Illegitimate.	Total.	Illegitimate.
1914 ..	91,971	7,712	24,967	—	10,072	—
1915 ..	89,380	7,369	30,279	—	12,482	—
1916 ..	71,646	6,000	20,009	—	8,611	—
1917 ..	64,483	7,474	20,296	—	9,724	—
1918 ..	64,386	7,694	26,447	—	14,955	—
1919 ..	61,715	7,237	14,124	1,131	7,658	469
1920 ..	76,552	7,017	14,741	1,162	6,100	364
1921 ..	70,250	6,115	15,636	1,041	4,991	336
1922 ..	60,121	4,736	18,948	1,064	8,678	453

Illegitimate Births.

Mr. A. V. ALEXANDER asked the Minister of Health the number of children born in each of the years from 1914–22, giving the numbers separately for illegitimate births.—Mr. CHAMBERLAIN replied: The numbers of children born (total and illegitimate) for each year 1914 to 1922 are shown below:—

Births: England and Wales.

Year.	Total.	Illegitimate.	Year.	Total.	Illegitimate.
1914	879,096	37,329	1919	692,438	41,876
1915	814,614	36,245	1920	957,782	44,947
1916	785,520	37,689	1921	848,814	38,618
1917	668,346	37,157	1922	780,124	34,138
1918	662,661	41,452			

TUESDAY, JULY 10TH.

Scottish Public Health Authorities.

Mr. DUNCAN MILLAR asked the Under Secretary to the Scottish Board of Health whether, in view of the widespread anxiety and apprehension created by the Report of Scottish Board of Health Consultative Council recommending the abolition of the parish councils in Scotland and of the smaller burghs and public health authorities, he could give an assurance that no steps were at present contemplated to give effect to the views of the Consultative Council, and that the fullest opportunity would be afforded to the parish councils and burghs and other public health authorities to express their views before any decision was arrived at.—Captain ELLIOT replied: I am now aware that the publication of the Report referred to has created anxiety and apprehension, but the hon. Member may rest assured that no decision will be taken on the matters referred to without full opportunity to the local authorities mentioned to express their views.

Selection of R.A.M.C. Officers.

Mr. BECKER asked the Under Secretary of State for War if all officers in the Royal Army Medical Corps eligible for selection to the higher ranks were personally interviewed by the selection board; and could he give his assurance that none would be passed over who had not been so interviewed.—Lieut.-Colonel GUINNESS replied: The answer is in the negative. I do not think that a system of inviting officers to attend and make out a case for their own promotion would be at all satisfactory, even if all the officers concerned were always available for such attendance, which they are not. It rarely happens, however, that an officer is not known personally to the majority of the selectors.

Appointments.

DENT, HELEN P., M.B., B.S. Lond., has been appointed Maternity and Child Welfare Medical Officer, Leicester.

GALBRAITH, S. N., M.B., Ch.B. Glasg., Medical Officer of Health for South-West Kent.

GIMBLETT, CHARLES LEONARD, M.D. Camb., F.R.C.S. Eng., Hon. Assistant Surgeon to the Royal Westminster Ophthalmic Hospital.

KIEP, W. H., M.B., Ch.B. Glasg., an Hon. Ophthalmic Surgeon to the Royal Ear and Eye Hospital, Bradford.

Certifying Surgeons under the Factory and Workshop Acts: **MCNAUGHTAN, W.**, M.B., Ch.B. Edin. (Hawes); **DOBSON, J. G.**, M.B., Ch.B. Edin. (Chirnside); **LOWRY**, M.R.C.S., L.R.C.P. Lond. (Brentford and Ealing); W. B., L.R.C.P. & S. Edin., L.R.F.P.S.Glasg. (W

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There seldom occurs a case in which the evidence drawn from the facts grouped under these four heads and duly weighed fails to yield a correct decision. And such evidence has this further advantage, that it is readily accessible.

THE WELFARE OF MENTAL PATIENTS.

Two gatherings, important in relation to the welfare of mental patients, were held in London on July 12th.

The Mental Hospitals Association

met at the Guildhall. Among the items on a full agenda was a report of the Executive Committee commenting on the Mental Treatment Bill recently introduced. It is accepted that the clauses, which are not in effect so far-reaching as was desired by the Association, contain provisions which, when passed into law, cannot fail to prove beneficial to those suffering from incipient or recurring mental illness. The Bill has received the careful consideration of the Committee which has addressed a communication to the Minister of Health upon various provisions. It is urged that as a general principle it is undesirable to coöpt members on visiting committees who are not directly elected by the ratepayers, and that it is not equitable to give persons who are not directly responsible to the ratepayers, power to coöperate in the direction of the expenditure of the ratepayers' money. As to out-patients, a visiting committee would not be able, it is thought, to contribute to the cost of an out-patient department for mental treatment in a general hospital. Moreover, where, as in many instances, the mental hospital is situated at a considerable distance from large centres of population, it might be desirable to institute an out-patient department away from the mental hospital. The members have been asked by those interested in the management of private institutions and registered hospitals who are subscribers to their Association to urge that no restrictions should be set up under the Bill on the facilities such institutions now have in connexion with the reception, maintenance, and discharge of voluntary boarders. In the opinion of the executive the provisions of the subsection of the Bill dealing with after-care militate against the voluntary principle; they consider it undesirable that after a patient has been discharged from trial he should be in any way associated with the institution. Other minor criticisms are made. Representatives of the Association on the Joint Conciliation Committee have been conferring with the National Asylum Workers' Union for some months past as to the possibility of stabilising, by improving the conditions of service of, the nursing staff in mental hospitals. It is held that probationers should be subject to medical examination before engagement and that they should have reached a certain standard of education—e.g., have passed either the seventh standard at an elementary school, or the Junior Oxford or Cambridge Local Examination, and that the governing authorities be requested to dispense with the services of any probationer nurse who does not make due and diligent efforts to attain the recognised standard of proficiency. The formation of a sports club in every institution to promote recreation among the staff is suggested. It was stated that the Joint Committee have been involved in correspondence with the Ministry of Health as to the constitution and proceedings of a committee set up by the Board of Control, "to consider the nursing service in county and borough mental hospitals and in what direction it can be improved," to which the Joint Committee were not invited to send representatives. As the constitution of the Board of Control's Committee did not commend itself to members of the Joint Committee, it had been unanimously decided not to accept the offer of the Ministry and of the Board of Control to give evidence and submit themselves or their representatives to cross-examination as to their proceedings; but the Joint Committee would continue to furnish the Board, as had been its practice in the past, with copies of the various recommendations which the Joint Committee may from time to time decide upon.

The inaugural meeting of the

National Council for Mental Hygiene

was held at Caxton Hall, Westminster. The chairman of the Council is Sir Courtauld Thomson and the joint hon. secretaries Dr. J. L. Birley and Lieut.-Colonel J. R. Lord. In America a national committee for mental hygiene has been doing valuable work for a number of years, and an international mental hygiene movement has now been launched. The chief purposes of the movement are to work for the conservation of mental health; to promote the study of mental disorders, mental defects, and delinquency in all their forms and relations; to obtain and disseminate reliable data concerning them, to help to raise the standard of care and treatment, and to coördinate existing agencies. The special aims of the British National Council include among others: the improvement of the mental health of the community; the study of the causes underlying congenital and acquired mental disease with a view to its prevention; the securing of a more important position for the study of psychiatry in the medical curriculum and the closer association of psychiatry with general medicine; to further the establishment of special clinics and out-patient departments for the early treatment of mental disorders, and to raise the standard of care and treatment in the public mental hospitals; the study of criminality, dependency, vagrancy, and prostitution, in so far as they are failures of adjustment by reason of mental disease or defect; the study of mental hygiene of child-life in relation to education and parental responsibility. The Council hopes to be the liaison between all societies, associations, and other bodies interested in or concerned with mental hygiene, and as far as it can with advantage coöperate with them. The annual subscription for full members is 1 guinea, for associate members 5s. Donations may be sent to hon. treasurer, Lord Southborough, at Room 55, Windsor House, Victoria-street, London, S.W. 1.

A BIBLIOGRAPHY OF SOCIAL HYGIENE.

A COMPREHENSIVE bibliography of social hygiene, demography, and vital statistics has just been issued by Prof. A. Grotjahn and Dr. phil. F. Kriegl, edited by Dr. Hans Haustein, of Berlin. (Berlin: Richard Schoetz. 1923. Pp. 262. 4s.) The pamphlet contains some thousands of references in various languages to books and papers which appeared in the year 1921, under headings which include the social hygiene of work, of food, of dwelling and clothing for children and young persons, social insurance, and the hygiene of reproduction. The pamphlet will be found a useful work of reference by all who are working in a field to which post-war conditions have given a very urgent importance.

A DETOXICATED PHOTOGRAPHIC DEVELOPER.

METOL, introduced in 1891 as a photographic developer, suffers from the drawback of being seriously irritating to the skin. This is the case with the ordinary commercial form, but it has now been shown by Mr. W. F. A. Herman (*Chemistry and Industry*, May 18th), working in the department of photographic research of the British Dyestuffs Corporation, that pure metol is quite innocuous to the skin. That this was the case has long been suspected, but Mr. Herman has been able to isolate and determine the constitution of the poisonous impurity. By adopting a modification in manufacture, metol free from irritant action can now readily be produced, and Mr. Herman has conferred a boon upon photographers.

A REGISTER BOOK FOR DANGEROUS DRUGS.

Messrs. John Wright and Sons, Ltd., have brought out a register recording the purchase, sale, and stock-in-hand of such dangerous drugs as are scheduled under the Act of 1920. It is intended for the use of medical men, and the preface contains extracts from the regulations issued by the Home Office in Janurary, 1923, including those applicable to (1) all doctors; (2) dispensing doctors. Different coloured pages with thumb-index are provided for records of morphine and salts, diamorphine (heroin) and salts, cocaine and ecgonine and salts, and medicinal opium. The whole is issued in a handy form at 7*s.* 6*d.*

COLONIAL HEALTH REPORTS.

Nyasaland.

THE report for this Protectorate for 1921, for some reason delayed, has now been presented to Parliament. It states that during the year the general health was satisfactory. In the Mlanje district small-pox broke out from time to time, apparently introduced from Portuguese East Africa. In other areas the outbreaks were of a sporadic nature and were easily controlled. Two cases of bubonic plague were reported from the North Nyasa district, but neither case was seen till after death. Although careful investigation was made no further cases were revealed, neither was there any noticeable epizootic disease among the rats with which the district is infested. Barium carbonate was reported to be the most satisfactory of the various rat poisons with which experiments were made during the year. As regards the treatment of venereal disease, experience seems to show that the mental attitude of the native is the same towards this disease as towards others, and that treatment is not usually sought until serious inconvenience is occasioned. Nevertheless, venereal hospitals for the treatment of natives were opened in seven districts during 1921, and the returns show that a beginning has been made in familiarising the people with the opportunities afforded them at these treatment centres. At the venereal hospitals the treatment of yaws is also undertaken, and later on it may be possible to deal more thoroughly with this disease, which is endemic and widely prevalent in the Dedza district. The medical staff was increased during the year, and this

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THE LANCET, JULY 21, 1923.

ABSTRACT OF A [*]
Presidential Address
ON
CONSIDERATIONS,
BACTERIOLOGICAL, TOXICOLOGICAL, HÆMATOLOGICAL, AND OTHERS THERETO AKIN, BEARING UPON
THE PSYCHOSES.

Delivered before the Medico-Psychological Association of Great Britain and Ireland on July 10th, 1923,

BY EDWIN GOODALL, C.B.E., M.D., B.S., F.R.C.P. LOND.,
MEDICAL SUPERINTENDENT, CARDIFF MENTAL HOSPITAL.

IN the course of toxic and febrile processes, such as occur in association with typhoid, erysipelas, malaria, pneumonia, influenza, psychoses may arise. Amongst infection-psychoses may be counted insanity of the puerperium; in association with epidemic encephalitis various psychoses develop, a fact of significance in the problems of the pathogenesis of these states. Of peculiar interest is the occurrence of disorders of motility in the course of and after this disease, resembling muscular disorders in katalepsy and katatonia. A recent and valuable addition to the literature of this subject is furnished in an article by Skliar, who has had the unusual experience of seeing mental disturbances in the course of typhus and relapsing fever, prevalent in Russia during the three winters, 1918–1920, inclusive. He also describes five cases of lyssa in which psychotic disturbances occurred. These disturbances also occur as a result of poisoning by alcohol and drugs such as hashish (*Cannabis indica*), lead, and mercury.

THE TOXIC FACTOR.

These disorders of mind, occurring in febrile processes, cannot be due solely to febrile disturbance; the toxic factor must be taken into account. We must persist in the inquiry as to whether certain of the insanities, of everyday occurrence and of unknown origin, and which, prima facie, appear to be of toxic origin are, in fact, ascribable to exogenous or endogenous toxins. To seek experimental evidence which would establish the presence of a toxin as the cause of any variety of mental disorder of unknown origin is a sobering experience, although some people seem to be on terms of familiarity with the toxins of the psychoses, especially as regards the toxins hailing from the bowel.

The evidence furnished by the morbid histology of the brain in the acute and recent psychoses is not in favour of anything approaching a virulent toxæmia, with the possible exception of the condition known as "acute delirium" or "acute delirious mania." Neither clinically (temperature, pulse, respiration) is there definite evidence of a febrile process. Yet, as certain drugs are toxins, able, though not virulent, to produce very definite mental disorder, whilst incapable of producing the bodily disturbance associated with a specific fever, so unknown proteins or their derivatives may function as toxins and cause some of the psychoses, and be responsible for such changes in the brain as the microscope reveals. We must look to biochemical research to help us in the supremely difficult problems of perverted metabolism.

[Dr. Goodall then gave a survey of the results of work in examination of blood, urine, cerebro-spinal fluid, and fæces, and continued as follows:]

The observations recorded are not in favour of a theory of toxæmia, referable to the action of intestinal bacteria, as a cause of the acute mental disorders investigated. But regard must be had to the great labour involved in this kind of work, and therefore the need for many workers, to accumulate results on a large scale. And better methods for detecting and cultivating intestinal organisms may come to our aid. As to this, reference may be made to articles in THE LANCET of July 15th, 1922, p. 127, and the *Journal of Mental Science*, of January, 1923, by Dr. Chalmers Watson, upon the intestinal flora as revealed by the use of a new culture-medium. Ford Robertson in his writings describes several cases of psychoses in which he found an abnormal intestinal flora. Constipation, stercoral retention, toxæmia, acute psychosis—this is the order of events, according to the expounders and the scribes. They can point to the remarkable effects sometimes produced by free purging upon the psychoses, and upon the psychical ebullitions of many persons outside asylums and of the chronic insane in them. But the factors operative, the mode of operation, the links in the chain—in regard to all these, our information is rudimentary. The hardihood which permits of the continued references to an alleged undue occurrence of "indican" (potassium-indoxyl sulphate) in the urine, pointing to auto-intoxication from the bowel, is astonishing, and betrays ignorance of the valuable work done by Stanford (1910–1912) in the Chemical Laboratory at the Cardiff City Mental Hospital.[†] Stanford's findings still hold good. No value attaches to the so-called "indican" evidence of intestinal toxæmia.

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fact, combined with other circumstances, enabled medical aid to be extended to districts hitherto unprovided for. Indian subassistant surgeons are stationed at posts of secondary importance, and, in addition, rural dispensaries are being opened in the more populous centres in each district under the charge of natives trained for the purpose and visited periodically by medical officers or subassistant surgeons. It is hoped that such schemes for increasing the medical facilities afforded to natives in remote districts will be further developed and extended in other directions as soon as the finances of the Protectorate permit. It is understood that the drug Bayer "205," which is being experimented with in the Northern Rhodesia, is a decided advance on any treatment which has hitherto been employed in the cure of trypanosomiasis. The medical entomologist is studying the preventive side of this disease. As regards sickness amongst the European population, 366 cases were treated during the year by the medical department, and there were 12 deaths. Malaria was responsible for 28 per cent. of the cases dealt with, and, of course, many cases of malaria are self-treated and do not come under official cognisance. Gastro-intestinal disorders, respiratory complaints, and dysentery made up the bulk of the other cases treated. There were 14 cases of blackwater fever, resulting in two deaths. European and native hospitals are maintained by Government at Blantyre, Zomba, and Fort Johnston, and additional native hospitals at Port Herald, Mlanje, and Karonga; others are in course of erection or are to be built later. The various missions established in the Protectorate continue to do a considerable amount of medical work. According to the census taken in April, 1921, the population of Nyasaland was 1486 Europeans, 563 Asiatics, and 1,199,934 natives (558,138 males and 641,796 females). The climate in its essential features is similar to that of the rest of Eastern Africa within the tropics. As a large proportion of the Protectorate lies at an altitude of 3000 feet or more the heat is not generally excessive.

Falkland Islands.

Mr. H. Henniker-Heaton, colonial secretary, in his report for 1921, states that according to the census taken in April of that year the total population of the colony, exclusive of crews of ships in harbour in Stanley, numbered 2087 (males 1182, and females 905). South Georgia, the only part of the dependencies which is permanently habitable, had at the same time a population of 1337 (of whom only three were females), mainly engaged in whaling, no fewer than 998 being set down as natives of Sweden or Norway. The Falkland Islands proper, consisting of East Falkland and West Falkland, are entirely devoted to sheep-farming; in general appearance they are treeless, bleak, and inhospitable, resembling closely parts of the north-west coast of Scotland and the Shetland Islands. The inhabitants are almost exclusively people of pure British descent; they are hardworking, thrifty, and peaceable. The climate is generally healthy, and there is neither endemic nor epidemic sickness in the country. In the dependencies, also, there is very little sickness, even colds being of rare occurrence, though some unhealthiness is caused by the absence of fresh provisions.

INSULIN "A.B." BRAND.

THE British Drug Houses, Ltd., announce that increased output of insulin "A.B." brand has enabled them to effect a reduction in its price from 2*s.* 6*d.* to 1*s.* 9*d.* per dose. Bottles containing 5 c.cm. (100 units or 10 doses) are now priced at 17*s.* 6*d.* per bottle; bottles containing 10 c.cm. (200 units or 20 doses) at 35*s.* per bottle. These prices have been arranged in agreement with the Medical Research Council and are effective as from July 12th, 1923. Supplies of insulin "A.B." brand now available are sufficient to meet all demands.

GAS CYLINDERS IN HOT WEATHER: SAFETY FIRST.

THE explosion of a gas cylinder in the operating theatre of a London hospital early this week—most fortunately without harm to life or limb—is a reminder of the fact that respect must be paid to the laws of expansion of liquids and gases, although almost complete immunity from such accidents in medical practice has led to their being overlooked. Oxygen and hydrogen being non-liquifiable at ordinary temperatures expand in orderly fashion, and although it is undesirable to expose such cylinders to direct sunshine the risk is not very great. But in the case of CO_2 and N_2O, which are present in liquid form in the cylinders, the coefficient of expansion is much greater than that of gases; hence, to guard against risk, these cylinders are only partially filled with liquid. The manufacturers enjoin strict precautions on their own staff. The British Oxygen Company, Ltd., for instance, issue a special *summer notice* to the effect that during hot weather full cylinders must not be left exposed to the sun in any part of the factory, and that naked cylinders conveyed in open vans, trucks, or by hand, must be covered.

A MONOGRAPH ON DEATH.

Dr. Eugen Holländer has brought out a German edition of Dr. F. Parkes Weber's well-known monograph on Death, under the title of Des Todes Bild. (Berlin: F. Fontane and Co. 1923. Pp. 274.) In a preface, addressed to the author, whose acquaintance he made shortly before the war "in the beautiful home of the Royal Society of Medicine in London," he speaks of medical men as having been in the past leaders and heralds of peace in all parts of the world and destined to play a part in putting on the lines again the derailed wheels of culture. Death, he says, has lost its terrors for hundreds of thousands of German families, and the problems of life and death have come nearer home to many who were not in the ordinary way philosophers; and Dr. Holländer instances the enormous increase in the German book trade as proof of the hunger after mental food and as a salutary counterpoise to mysticism and the resort to priestcraft. Apart from the preface, he has not added to Dr. Weber's book (which has on economical grounds been much abbreviated) material of his own, "in view of the completeness of the original." His prefatory remarks conclude with a note on euthanasia, or the teaching of the right manner of dying, as a lost art, which has, more than any other medical science, lapsed into forgetfulness. Alongside the ideal of a beautiful life stands as equally to be desired a beautiful death.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, July 16th.—10 A.M., Mr. Maingot: Surgical Pathology. 2 P.M., Mr. Addison: Surgical Wards. 3 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 12 noon Dr. Burrell: Chest Cases. 2.30 P.M., Dr. Pritchard Medical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 11 A.M., Mr. Simson: Gynæcological Demonstration. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Bishop Harman: Eye Dept. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Banks-Davis: Throat, Nose and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.
TUESDAY, July 17th.—4.30 P.M., Mr. Leonard Phillips: The Scope of Cæsarean Section.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Demonstration of Clinical Cases at 3.30 P.M.
MONDAY, July 16th.—Mr. Aubrey Goodwin: Gynæcological.
TUESDAY.—Dr. J. Metcalfe: Radiological.
WEDNESDAY.—Mr. C. H. Hayton: Throat and Nose.
THURSDAY.—Dr. Yealland: Medical.
FRIDAY.—Mr. E. Gillespie: Surgical.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, July 19th.—5 P.M., Mr. L. C. Phillips: The Treatment of Ante-partum Hæmorrhage.

THE LANCET: SUBSCRIPTION RATES.

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	Three Months	0 10 6
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	Six Months	1 5 0
	Three Months	0 12 6

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ABSTRACT OF A[*]

Presidential Address

ON

CONSIDERATIONS,

BACTERIOLOGICAL, TOXICOLOGICAL, HÆMATOLOGICAL,

AND OTHERS THERETO AKIN, BEARING UPON

THE PSYCHOSES.

Delivered before the Medico-Psychological Association of Great Britain and Ireland on July 10th, 1923.

BY EDWIN GOODALL, C.B.E., M.D., B.S.,
F.R.C.P. LOND.,
MEDICAL SUPERINTENDENT, CARDIFF MENTAL HOSPITAL.

IN the course of toxic and febrile processes, such as occur in association with typhoid, erysipelas, malaria, pneumonia, influenza, psychoses may arise. Amongst infection-psychoses may be counted insanity of the puerperium; in association with epidemic encephalitis various psychoses develop, a fact of significance in the problems of the pathogenesis of these states. Of peculiar interest is the occurrence of disorders of motility in the course of and after this disease, resembling muscular disorders in katalepsy and katatonia. A recent and valuable addition to the literature of this subject is furnished in an article by Skliar, who has had the unusual experience of seeing mental disturbances in the course of typhus and relapsing fever, prevalent in Russia during the three winters, 1918–1920, inclusive. He also describes five cases of lyssa in which psychotic disturbances occurred. These disturbances also occur as a result of poisoning by alcohol and drugs such as hashish (*Cannabis indica*), lead, and mercury.

THE TOXIC FACTOR.

These disorders of mind, occurring in febrile processes, cannot be due solely to febrile disturbance; the toxic factor must be taken into account. We must persist in the inquiry as to whether certain of the insanities, of everyday occurrence and of unknown origin, and which, prima facie, appear to be of toxic origin are, in fact, ascribable to exogenous or endogenous toxins. To seek experimental evidence which would establish the presence of a toxin as the cause of any variety of mental disorder of unknown origin is a sobering experience, although some people seem to be on terms of familiarity with the toxins of the psychoses, especially as regards the toxins hailing from the bowel.

The evidence furnished by the morbid histology of the brain in the acute and recent psychoses is not in favour of anything approaching a virulent toxæmia, with the possible exception of the condition known as "acute delirium" or "acute delirious mania." Neither clinically (temperature, pulse, respiration) is there definite evidence of a febrile process. Yet, as certain drugs are toxins, able, though not virulent, to produce very definite mental disorder, whilst incapable of producing the bodily disturbance associated with a specific fever, so unknown proteins or their derivatives may function as toxins and cause some of the psychoses, and be responsible for such changes in the brain as the microscope reveals. We must look to biochemical research to help us in the supremely difficult problems of perverted metabolism.

[Dr. Goodall then gave a survey of the results of work in examination of blood, urine, cerebro-spinal fluid, and fæces, and continued as follows:]

The observations recorded are not in favour of a theory of toxæmia, referable to the action of intestinal bacteria, as a cause of the acute mental disorders investigated. But regard must be had to the great labour involved in this kind of work, and therefore the need for many workers, to accumulate results on a large scale. And better methods for detecting and cultivating intestinal organisms may come to our aid. As to this, reference may be made to articles in THE LANCET of July 15th, 1922, p. 127, and the *Journal of Mental Science*, of January, 1923, by Dr. Chalmers Watson, upon the intestinal flora as revealed by the use of a new culture-medium. Ford Robertson in his writings describes several cases of psychoses in which he found an abnormal intestinal flora. Constipation, stercoral retention, toxæmia, acute psychosis—this is the order of events, according to the expounders and the scribes. They can point to the remarkable effects sometimes produced by free purging upon the psychoses, and upon the psychical ebullitions of many persons outside asylums and of the chronic insane in them. But the factors operative, the mode of operation, the links in the chain—in regard to all these, our information is rudimentary. The hardihood which permits of the continued references to an alleged undue occurrence of "indican" (potassium-indoxyl sulphate) in the urine, pointing to auto-intoxication from the bowel, is astonishing, and betrays ignorance of the valuable work done by Stanford (1910–1912) in the Chemical Laboratory at the Cardiff City Mental Hospital.[†] Stanford's findings still hold good. No value attaches to the so-called "indican" evidence of intestinal toxæmia.

Is there satisfactory evidence that disinfectants, such as izal, kerol, dimol, when given by the mouth favourably influence mental disorders of any kind? I am not aware of any. I have personally tried various disinfectants for years. Recently 11 cases of acute and recent mental disorder (melancholia, confusional states, delusional states), and one of chronic hypochondriasis, were treated with dimol in powder form, four of them receiving 8 gr. of the powder and eight 12 gr. of the same, thrice daily (1 part of dimol in 3 parts of the powder), in most cases for several weeks or months. Five other similar cases were given one kerol capsule thrice daily for like prolonged periods. It cannot be said that any dramatic or decisive results were observed in cases which improved or recovered. Nevertheless, in my opinion, such drugs are worth extensive trial for long periods, preferably combined with lavage of the whole large intestine.

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Although, as far as my reading goes, very little notice has been taken of Ford Robertson's work in either English or foreign literature, my opinion is that this work cannot be ignored, and should be repeated on the lines indicated by him. This would involve bacteriological examination by aerobic and anaerobic methods of the naso-pharynx, of the stools, and of the urine, using, amongst other media, the hæmoglobin-agar introduced by Ford Robertson and Orr, a medium which is very rarely employed. The extensive work of Cotton and his associates on focal infection in mental disorders is an additional argument for the cultivation of this field of research. Amongst sites of focal infection are the teeth, tonsils, naso-pharynx, gastro-intestinal tract, and genito-urinary tract. The improvement in mental disorders recorded as following removal of sources of infection, and vaccination with organisms found, is clinical evidence, at any rate, of toxæmia.

Time will not allow me to deal further with this portion of my theme. I content myself with drawing attention to an observation recorded by Scholberg and myself. In the wash-out (with normal saline) of the fasting stomach in cases of insanity at adolescence (many of these of the dementia præcox group) we found pus cells in a very large proportion—about 60 out of 68 cases. I understand from Dr. H. A. Scholberg, who is pathologist to the Cardiff Royal Infirmary and to the Cardiff Mental Hospital, that these are not found, in his experience, amongst the usual infirmary patients, apart from instances of lesions of the gastric mucosa. This would appear to dispose of the decayed-teeth hypothesis. Possibly some focus in the naso-pharynx was the original source of these pus cells. The matter is at present obscure.

TOXICITY OF BLOOD, CEREBRO-SPINAL FLUID, AND URINE IN MENTAL DISORDERS.

The following summary of information bearing upon the question of the toxicity of the blood, cerebro-spinal fluid, and urine of cases of mental disorder may be recorded. In the course of experimental work done personally or in conjunction with co-workers (Drs. Scholberg and Cameron), a very large number of rabbits and fowls have been injected with blood serum, or blood corpuscles, or the stroma of such, from all the main clinical varieties of insanity, including cases of violent mania, profound melancholia, dementia præcox in its various forms, epilepsy, and dementia paralytica. The losses of weight and the deaths resulting from injections with serum and blood corpuscles were fully equalled by those observed in control animals injected with the like from healthy blood; so that effects a priori ascribable to a toxic cause were, in fact, not due to such. In the case of injection with the stroma of r.b.c., whilst heavy death- and loss of weight-rates obtained in animals injected from the cases of acute insanity, there were no losses and no deaths in the case of those injected with control blood. On this point further experience is necessary.

The small proportion of deaths in fowls compared with rabbits (serum used in both) argues greater resistance in the former. Contrary to what has been affirmed, we did not find the fowl a better precipitin-producer than the rabbit.

Meyer's experiments upon toxicity of the blood of epileptics show the need for further research on the point, and preferably with animals higher in the scale than those used by him. Ten of 11 guinea-pigs injected intraperitoneally with 10–15 c.cm. of defibrinated blood from normal persons showed no symptoms. The eleventh died after convulsions. Of ten guinea-pigs injected with blood removed during an epileptic seizure, nine had typical tonic clonic convulsions in from 1 to 5 hours after injection. Blood removed in the interval between fits affected the animals according to the time elapsing since the last seizure and to the severity of the disease. Preda and Popea (cited by Barbé) state that the serum of epileptics is not toxic for man. Cuneo has recently described a research by which he has obtained from the blood serum of epileptics albumoses, which, injected intravenously into dogs, produce the characteristic phenomena of convulsive seizure. He ascribes epileptic seizures to the action of these albumoses. His paper describes the mode of formation of these substances in the blood of epileptics. Loewe found that the dried insoluble portion of the adialysable substance of urine is, in the katatonic type of dementia præcox, in dementia paralytica (after seizures), and in delirium tremens, highly toxic. In epilepsy it is, in addition, capable of producing seizures very like epileptic ones, injected intravenously. Similar adialysate from the urine of normal persons is not toxic. I consider that further work requires to be done on this subject of toxicity of the body fluids, subdural and intraperitoneal injections being employed.

CHANGES IN THE LEUCOCYTE COUNT.

The existence of leucocytosis in toxic conditions has naturally led various workers to seek for evidence of toxicity in the psychoses as shown by quantitative and qualitative changes in the leucocyte count. I would summarise present knowledge in regard to the leucocyte count in those mental disorders in which it has principally, if not wholly, been investigated as follows:—

Insanity of Adolescence (Dementia Præcox).—In the earlier phases there is a moderate increase in the total white-cell count, with relative increase of the neutrophiles. Thereafter, in marked exacerbations of the morbid processes, these increases are more pronounced. The progress towards dementia is characterised by a relative lymphocytosis, with a low total count. There is not sufficient evidence of differences—quantitative or qualitative—in the cell counts in the different forms of dementia præcox.

Insanity with Epilepsy.—There is a considerable degree of accord between observers, the results showing leucocytosis and polynucleosis with *hypo-eosinophilia* in connexion with seizures, *uncharacteristic conditions* obtaining in the intervals.

Mania—Melancholia.—A high total count, with relative neutrophile increase at the onset; these subside as the disease progresses; perhaps a second minor increase accompanies symptoms of recovery. The persistence of this, with a normal percentage of neutrophiles after recovery, is a favourable sign (Bruce). A fall in the neutrophile percentage without mental improvement is an unfavourable sign (McDowall). In unfavourable cases the counts are variable, and lymphocytosis becomes apparent with the lapse of time. In subacute and chronic conditions, lymphocytes predominate (Klippel and Lhermitte).

More evidence is required as to subacute and long-lasting cases, and as to the count at the stage when it is apparent that recovery is to take place. Whilst statements as to isolated occasional white-cell counts in acute mania and melancholia are pretty frequent, it is remarkable how few have conducted inquiry in these conditions over long periods. This criticism, as I have indicated, applies to the cell counts in the psychoses generally, but one would have thought an exception would have been made in cases of the particular kind just discussed, conveying strongly, as they do, the impression of toxic pathogenesis. In puerperal insanity the leucocyte count resembles that of acute mania.

States of Acute Confusion.—Leucocytosis: polynuclear increase (both moderate); hypo-eosinophilia; these pass away with decline of the illness and recovery.

Dementia Paralytica.—In the first stage moderate leucocytosis with relative neutrophile increase; in the early second stage, these conditions continue, but in the later second and in the third stages, whilst the moderate leucocytosis is maintained, the lymphocytes, small and large, are relatively increased at the expense of the neutrophiles. A relative polynucleosis, with frequently only a slight increase in the total count, accompanies the febrile attacks of the later stages, also the paralytic seizures. In states of remission and of marked quiescence there is a relative lymphocytosis, replaced by polynucleosis on the occurrence of exacerbations. The evidence furnished by the leucocyte count in the psychoses dealt with is in favour of toxæmia, not a grave form of it.

The observations of Pfeiffer and de Crinis, published in 1913, relative to the increase of anti-proteolytic substances (as brought out by the *antitrypsin test*) in the serum of cases of the "organic" as distinguished from the "functional" and constitutional psychoses, are borne out by Bolten's observations, made in 1918, but still require confirmation. In case of confirmation it remains that the nature of the antitryptic substances (so-called "defence-ferments") is unknown. More work appears to have been done on the continent with Abderhalden's method, which is declared to demonstrate the presence in the serum of protective ferments against break-down products of parenteral protein—e.g., from the cerebral cortex, genital glands, &c. These ferments are stated to be present in cases of dementia paralytica and dementia præcox, but not in "functional" and "constitutional" psychoses—e.g., manic-depressive, paranoia. These findings are still in dispute. The latest work with which I am acquainted is that of Ewald, to which I would refer those interested.

EFFECTS OF INTERCURRENT MALADIES ON MENTAL DISORDER.

Efforts to ameliorate or cure mental disorder prompted by the observed effects in these directions of intercurrent maladies are familiar to us all. They are sometimes dramatic. Probably typhoid, erysipelas, and malaria are most efficacious, but pneumonia is also potent, as is also a septic infection. A febrile reaction is not an essential factor in the production of improvement or cure of the insanity. I should say that mania, melancholia, confusional, and stuporose states are chiefly benefited by intercurrent disease. Intercurrent disease may bring about remarkable remissions in dementia paralytica; remissions of extraordinary length are recorded.

The attempt to imitate the effect of intercurrent disorders by the subcutaneous injection of nucleinic acid, or sodium nucleinate, dates back to about 1909. Sodium nucleinate was probably chosen because of its ability to produce a decided leucocytosis. Recently "phlogetan," a substance stated to be a derivative of albuminoid bodies containing nucleo-protein from cell-contents, has been employed by Fischer and others as being more intensive in action than nuclein. The work of these authors shows that a leucocytosis results from these injections, and, in my experience, with sodium nucleinate the injection results in leucocytosis with a considerable proportionate rise in the neutrophile count. The pulse-rate was increased in my observations, but rise in temperature was not marked. Having regard to the results recorded by the above workers in cases of dementia præcox, and by others in psychoses with indications of a toxic origin, one would have thought that this treatment, associated with the use of colloidal metals, which also produce leucocytosis, with increase in the neutrophile percentage, would have been more persistently and extensively tried.

From a paper published by Gerstmann in 1922, it appears that the Vienna School, under Prof. Wagner-Jauregg, who instituted the treatment, is still systematically carrying out the treatment of dementia paralytica by the subcutaneous injection (accompanied or not by scarification) of the parasite of tertian ague into the patient. After 8 to 12 pronounced malarial attacks, treatment by quinine and neo-salvarsan is instituted. I would refer you to the article which I cite for an account of the successful results (in respect of production of remissions) achieved; also one by Wagner-Jauregg in the *Journal of Nervous and Mental Disease* of May, 1922, and one by Pilcz in THE LANCET of Jan. 6th, 1923, p. 19. This therapeutic measure is also favourably reported upon by Gans. This treatment of dementia paralytica, with a view to production of remission, by the inoculation of patients with blood taken from patients shortly before a malarial attack, or blood of mice which had been inoculated from a case of relapsing fever—the mental cases being inoculated either subcutaneously or intravenously—is also being carried out at the Hamburg Psychiatric Clinic and the results up to date (1922) are fully reported upon by Kirschbaum. I would suggest that a reaction with production of anti-substances to the spirochæte of relapsing fever, or even to the *Plasmodium malariæ* (a protozoon), might theoretically be expected to be more efficacious in dementia paralytica than any reaction as a result of inoculation of bacilli, since the above organisms are biologically more closely related to the spirochæte of syphilis. Stimulation of the defences by inoculation with the virus of syphilis would seem to be a more rational procedure than the above. According to Scharnke (Marburg) cautious experiments in this direction have long been in progress, though I have not come across any accounts of the results.

The beneficial results of intercurrent maladies, and of the therapeutic measures referred to above, upon the insanities may be examples of non-specific protein therapy. We are far from understanding the rationale of this treatment, and it is unprofitable to discuss the theories advanced on the subject.

It would appear worth while to pursue the inquiry as to the effect of non-specific parenteral protein therapy in mental disorders suggestive of a toxic origin. Any experience available is worth brief record, even though negative; in the latter case, time will be saved to intending workers. I have used a 1 per cent. solution of Armour's peptone, in doses up to 1 c.cm., intravenously. This was sterilised by filtration through a porcelain candle. With it I obtained no physical or psychical evidence of reaction. I would make the suggestion that Witte's peptone, either added to the above or alone, might be tried. The risk of anaphylaxis cannot be dismissed with intravenous injections, and it is doubtful whether they are superior to intramuscular ones.

PRODUCTION AND SPECIFICITY OF ANTIBODIES.

Production of antibodies by inoculation of animals with the sera, red blood corpuscles, or stroma of same, of cases of mental disorder: specificity or otherwise of such. In 1913 I inquired into the point as to whether the blood-serum of the insane produces specific precipitin when inoculated intravenously into rabbits. The results were estimated by naked-eye observations. From these it was gathered that a given anti-serum produced the same amount of precipitate, whether put up against the actual serum by which it was produced, the serum of patients suffering from the same mental disorder, or the serum of patients suffering from other kinds of insanity. There was no specificity of reaction. There is room for further work in this direction, an agglutinoscope, or even a low power of the microscope, being employed in reading the results. In 1921–1922 further work on the same subject was done by Dr. Scholberg, Dr. Cameron (of Cardiff), and myself. Red blood corpuscles, or the stroma of such, were used as antigens, in addition to serum. The same lack of specificity was noted. Interesting is our failure to produce antibodies (as tested against c.s.f. of G.P. and non-G.P.) by the injection into rabbits of large amounts of cerebro-spinal fluid from G.P.'s, and choroid-plexus emulsion, from cases of dementia paralytica, and control-plexuses from other kinds of disease. In conjunction with Scholberg and Cameron I have entered into the question of production of specific anti-substances by the injection into animals of the serum, whole red blood corpuscles, or stroma of such, from cases *recently received* of acute mental disorder. The argument was that if these acute and recent states had been produced by an unknown toxin, such would have produced antibodies in the patient's blood, which, in turn, might be expected to evoke anti-substances when injected into animals. It was found, however, that such anti-substances as were produced were not specific, but reacted as much with a control's blood as with that of the patient from whom the injections were made. The antibodies looked for were precipitin, hæmolysin, and hæmagglutinin; there is room for further research as to complement fixation.

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BRONCHOMONILIASIS.

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Although cultures may be obtained on ordinary media, a more copious growth occurs in those which are slightly acid in reaction and contain a percentage of some sugar—e.g., glucose or maltose. Growth occurs readily at room temperature, but in some cases is more rapid at 37° C. On solid media (Fig. 3) the cultures are usually of a creamy-white colour; later, a brownish pigmentation often appears. They are composed of the yeast-like bodies only. In liquid media, bacillary and filamentous forms may be found (Fig. 2). Numerous species have now been isolated. For their identification, use has been made of their powers to ferment various "sugars" with the production of gas. Castellani has demonstrated that these powers are remarkably constant in freshly isolated strains, and on this basis has evolved a comprehensive classification.[7]

Infection in Man.

In man direct infection from case to case may possibly occur. More commonly, however, bronchomoniliasis results from the inhalation of contaminated particles. The relatively high incidence among tea-tasters in Ceylon confirms this view, and gives some indication of the importance of the occupational factor. The further possibility that pulmonary infection may occur by spread from a cutaneous source is suggested by the researches of Wade,[8] who succeeded in producing chronic lesions with cavitation in the lungs of a monkey after subcutaneous injection of a broth culture of *Blastomyces dermatitidis.* It is noteworthy that in cases of primary infection of the respiratory tract the mouth and pharynx usually escape. Secondary infection from this source may, however, occur in debilitated persons. Instances of mixed infection are not uncommon, notably with the tubercle bacillus or, in tropical countries, with *Spirochæta bronchialis* or *Paragonimus westermanni.*

Clinical Features.

Clinically, all grades of severity are to be met with. In the milder cases the general health is not seriously impaired, and there is very little fever. Physical examination reveals signs of bronchitis, or perhaps of broncho-pneumonia. In the more severe instances wasting is marked, and may be accompanied by all the signs and symptoms usually associated with pulmonary tuberculosis. Intermediate types are not uncommon and may run a prolonged course with one or more relapses.

Post-Mortem Findings.

As the majority of cases recover, post-mortem records are scanty. It would appear, however, that the initial lesion is a bronchitis, from which extension may occur with the production of an acute or chronic broncho-pneumonic consolidation. In some instances circumscribed tubercles may be found. Mendelson,[4] describing a chronic case in which death occurred from intercurrent disease, states that the lungs were firm and contained numerous white nodules resembling those found in tuberculosis—except for the fact that they showed no sign of breaking down. Boggs and Pincoffs[9] record a further case, complicated by the presence of carcinoma mammæ in which abscesses above and below the left clavicle communicated through numerous small openings in the thoracic wall with a localised empyema beneath it. The left lung was densely adherent to the chest wall. Its upper lobe was solid, firm, and grey. In the lower lobe were scattered areas of consolidation, especially at the apex. The bronchi showed evidence of inflammation, and the hilus glands were enlarged and contained translucent areas. A third case, complicated by pulmonary tuberculosis, is reported by Macfie and Ingram.[10] A pyo-pneumothorax was present on the left side, and contained thick creamy pus. Numerous tubercles were present in both lungs, many of them caseating. Tubercle bacilli were demonstrated in the lungs; in the pleura both tubercle bacilli and *Monilia tropicalis* were present. These two organisms had been found in the sputum in large numbers during life.

Animal Experiments.

Various attempts have been made to induce direct infection of the respiratory passages of animals. In 1912 Castellani[11] succeeded in producing broncho-pneumonia in a guinea-pig as the result of repeated insufflations of tea-dust. In 1915 Boggs and Pincoffs[9] obtained lesions in the lungs and other viscera of rabbits as the result of injections of pure cultures of Monilia into the trachea. Insufflation experiments carried out on monkeys by Chalmers and MacDonald failed to give clinical results.[24] The subcutaneous route has also been utilised. Using pus and sputum, Farah[25] obtained negative results, and with broth cultures only succeeded in producing a local induration in rabbits. Intraperitoneal injection, however, resulted in a brisk general reaction followed by recovery; intravenous administration invariably produced disseminated lesions, notably in the lungs and kidneys, and resulted in death within a few days. This last observation has been confirmed by many observers.

With regard to these experiments, which are reported to have given negative results, it is of interest to note that Mendelson[12] succeeded in finding areas of consolidation and small non-caseating nodules, together with enlargement of the bronchial glands in guinea pigs, which failed to show any clinical disturbance, even after the lapse of several weeks after inoculation.

It seems to be fully established that lesions produced by various species of Monilia are indistinguishable from each other. Using cultures of *Monilia pinoyi* isolated from Case 2, we have obtained the following results in rabbits:—

1. As the result of intravenous injection of 5 c.cm. of a moderately turbid emulsion, one rabbit died after three days; a second, obviously ill and rapidly losing weight, was killed on the eighth day. In both, numerous miliary lesions resembling tubercles were found in the organs, especially in the lungs, liver, spleen, and kidney (Fig. 4). Cultures made from these yielded a pure growth of *Monilia pinoyi*. Sections showed the presence in them of both oval and filamentous forms of Monilia in large numbers. In all the organs the perivascular distribution of the lesions was very noticeable. In the lung there was also evidence of peribronchial infiltration.

2. Intratracheal injection of similar emulsions produced no gross clinical symptoms apart from a slight cough. This rabbit was killed after eight months. The only macroscopic lesions found were small scattered patches of consolidation in the lungs. In sections, apart from the consolidation, marked peribronchial infiltration could be seen (Fig. 5), and small tubercles composed chiefly of endothelial and plasma cells and having hyaline non-caseating centres.

In the consolidated areas the arteries showed very obvious thickening.

Cases.

The following cases may be of interest in that their nature was discovered in the course of routine investigation of patients in this country. The first occurred in the private practice of one of us (Th. J.), the others among patients admitted to St. Bartholomew's Hospital.

CASE 1.—A married woman came under the observation of one of us (Th. J.) in April, 1920, suffering from an illness which presented all the clinical features of pulmonary tuberculosis. For two years she had been troubled by cough and the expectoration of muco-purulent material, at times blood-stained. Fever was present, accompanied by sleep sweats and progressive emaciation, and weakness which had for some time confined her to bed. Well-marked signs of consolidation were present at the apices of the lungs. A curious feature of the case was the fact that, although the sputum had been examined on no fewer than 17 occasions tubercle bacilli had never been found. A fresh specimen was obtained, and in it were seen numbers of tiny white masses, which proved to consist of yeast-like bodies of which large numbers were visible in films. No tubercle bacilli were seen. Cultures from this and from subsequent specimens on Sabouraud's medium yielded a profuse growth of Monilia (untyped).

As a result of these findings increasing doses of potassium iodide were given. The effect was most marked. The general condition improved rapidly, and within two months the patient was able to get up and to walk about. She was seen again at the end of a year, and appeared to be in perfect health.

This case illustrates how chronic may be the course of the infection, and how readily the condition may be confounded with that of pulmonary tuberculosis.

CASE 2.—A man of 32 was admitted under the care of Dr. H. H. Tooth in December, 1920. He had for the past two years been engaged in unpacking syphons sent from Austria, in dirty and dusty straw. Both he himself and his fellow workers frequently suffered from pustules on the exposed parts of the arms and face. About ten days before admission he developed a slight cough with scanty expectoration. This gradually increased in severity and became associated with fever and malaise. Herpes labialis was present on the left side. The fauces were red and injected, and there were signs of consolidation at the base of the right lung—signs which did not wholly disappear until a month later. The spleen was just palpable. The temperature began to fall on the eleventh day after the onset of acute symptoms, and reached normal by lysis. Thenceforward convalescence was *rapid*, *interrupted* only by an acute follicular tonsillitis in the fourth week.

The sputum, at first scanty, later became more copious; it was muco-purulent and free from blood. Numerous small white specks were visible in it. In films were seen numbers of oval Gram-positive bodies, and numerous bacillary and filamentous forms. Cultures on Sabouraud's medium yielded a copious growth of *Monilia pinoyi*.

When last seen, some six weeks after admission, the patient was in good health and free from cough. Monilia was still present in the sputum, though in smaller amount than previously.

CASE 3.—A girl of 16, a cigarette packer, came under Dr. Tooth's observation in March, 1921, with signs of broncho-pneumonia at the base of the left lung, which persisted for three weeks. The onset was sudden, accompanied by cough and by a considerable rise in temperature, which fell to normal by lysis on the sixth day. As in the previous case, convalescence was interrupted by an acute tonsillitis with expected to evoke anti-substances when injected into animals. It was found, however, that such anti-substances as were produced were not specific, but reacted as much with a control's blood as with that of the patient from whom the injections were made. The antibodies looked for were precipitin, hæmolysin, and hæmagglutinin; there is room for further research as to complement fixation.

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however, Monilia was demonstrated in film and grown in pure culture. It would appear, therefore, that this procedure is of some diagnostic value.

(*b*) There is no record in published cases of resort to blood culture. In view of the possibility of generalisation of the infection, positive results might be expected in some instances. Cultures in sugar-broth media taken from Cases 2 and 3 of the above series proved sterile.

(*c*) Agglutination and complement-fixation tests are sometimes of value. No evidence of the presence of specific agglutination could be found in the sera of Cases 3 and 4, although after the administration of an autogenous vaccine agglutination occurred in Case 2 in serum dilutions from 1 in 5 to 1 in 50.

(*d*) In Cases 5 (*M. pinoyi*) and 4 (*M. guillermondi*) an attempt was made to establish the diagnosis by means of cutaneous inoculation of protein isolated from a culture of *Monilia pinoyi*. In neither instance did any reaction occur.

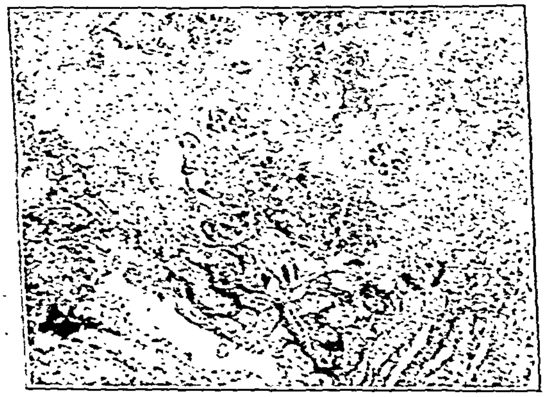
In those cases where the lesion is purely local those methods of investigation which aim at the detection of the organism in the circulation, or which depend on the recognition of specific general reactions, are hardly applicable. There is, however, evidence to suggest that dissemination does occur and that the use of these methods for diagnostic purposes is worthy of trial.

Treatment.

Authorities are unanimous in their opinion that the administration of iodine is beneficial. For oral administration potassium iodide in large doses is sometimes effective, although tinct. iodi. (French Codex) is perhaps a more active preparation. Castellani recommends saiodin (10–20 gr. t.d.s.) in cachet. For intramuscular injection lipiodol in doses of 1–2 c.cm. (0·54–1·08 g. iodine) daily is of use.

In the cases recorded above potassium iodide was administered in doses of from gr. xxx.–lx. per diem. The persistence of Monilia in the sputum after convalescence is due in part to the fact that the patients neglected treatment, and in part no doubt to the relative smallness of the doses ordered. Cases 2 and 4 were given autogenous vaccines in doses of from 10–2000 millions. No reaction of any kind was observed.

FIG. 4.



Miliary lesions resembling tubercles found in kidney of rabbit after intravenous injection of 5 c.cm. of a moderately turbid emulsion of *Monilia pinoyi* culture isolated from Case 2.

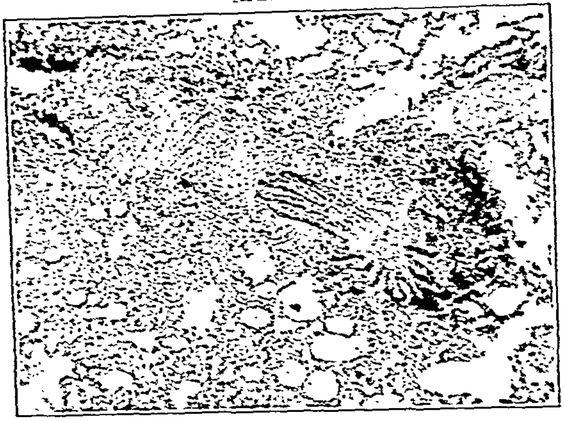
Prognosis.

Mild cases tend to recover spontaneously. There seems to be no doubt, however, that efficient treatment is capable of considerably modifying the course of both the mild and the more severe infections, and of producing a rapid improvement in many cases. To avoid, as far as possible, the danger of relapse, the patient should be kept under the influence of iodine for some time after convalescence is complete.

Conclusion.

In conclusion, it is suggested that bronchomoniliasis is of more frequent occurrence in this country than has hitherto been suspected, and that, as the clinical features are in no way distinctive, the investigation of sputa for the presence of fungi will well repay the trouble entailed.

FIG. 5.



Section of rabbit's lung showing marked peribronchial infiltration and small tubercles, composed chiefly of endothelial and plasma cells and having hyaline non-caseating centres.

We wish to thank Dr. H. H. Tooth and Sir Thomas Horder for permission to investigate and to publish these cases and, more especially, for the kindly interest which they have taken in our work.

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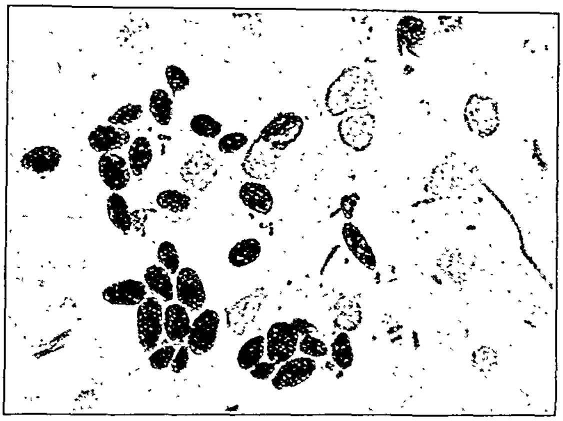
exudation occurring in the fifth week. The sputum was copious and frothy at first; later it became more scanty and tenacious. In films were numerous *Gram-positive* diplococci and filaments. Culture yielded a growth of pneumococci (type 2) and of *Monilia pinoyi.*

The patient was last seen ten weeks after the onset of her illness. She was in good health, the amount of sputum was very small, but still contained Monilia.

CASE 4.—A woman of 47, a needleworker, was admitted to hospital under the care of Dr. Tooth in April, 1921, complaining of malaise and obscure pain in the right side of the chest. An area of consolidation was present at the base of the right lung, over which coarse pleural friction was audible. A few days later a further area of consolidation appeared at the base of the left lung. Recovery was gradual and uninterrupted. The temperature remained raised for 14 days, and fell to normal by lysis. The signs of consolidation, however, did not wholly disappear for some weeks.

FIG. 1.

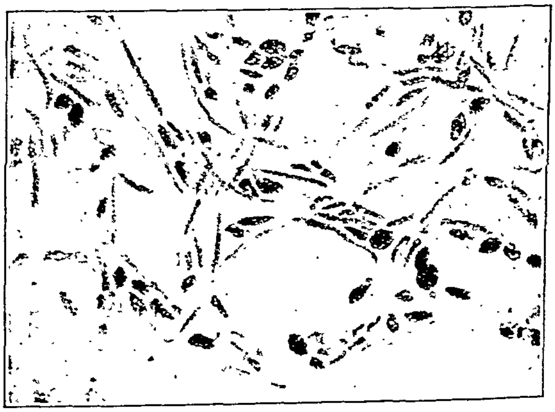


Fungi of Monilia group in sputum, appearing as round or oval yeast-like bodies.

The sputum in this case was never copious. Repeated cultures on Sabouraud's medium yielded a plentiful growth of *Monilia guillermondi.*

CASE 5.—A girl of 15, a blouse machinist, was admitted to hospital in May, 1921, under the care of Dr. Tooth, suffering from cardiac failure, following a recent attack of rheumatic fever. She was febrile, and coughed up a moderately large amount of muco-purulent sputum, from which a profuse growth of *Monilia pinoyi* was obtained on several occasions. Signs of consolidation were present at the base of the left lung. After a few days generalised râles and friction at the base of the right lung appeared. Later 28 c.cm. of clear, sterile, straw-coloured fluid were removed by aspiration from the left pleural cavity. The patient's cardiac condition failed to improve. She died two months after admission. Autopsy revealed the presence of severe lesions in the heart. There was a small amount of fluid in both pleural cavities. The lungs were very œdematous but otherwise normal.

FIG. 2.



Bacillary and filamentous forms found in liquid media.

Unfortunately, no detailed examination was made for evidence of Monilia infection.

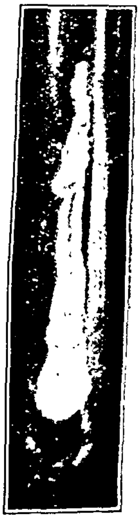
The following case is an instance of mixed infection with Monilia and the tubercle bacillus, and is of interest because, as the diagnosis of phthisis appeared clear, the sputum was included in the number of that examined as controls.

CASE 6.—A housewife, aged 24, was admitted in December, 1921, under the care of Sir Thomas Horder. She had been in poor health for four months, during the last of which she had been confined to bed, and had lost weight rapidly. Cough was troublesome, with expectoration of much muco-purulent material. On several occasions examination showed the presence of large numbers of tubercle bacilli, of pneumococci, and also of *Monilia pinoyi*, both in yeast-like and filamentous forms. The patient remained under observation for two months, during which time her condition steadily deteriorated.

Although it would appear that the various species of Monilia are widely distributed, records of published cases give some indication of the local predominance of certain of them—e.g. *M. pinoyi* in Egypt and *M. tropicalis* in Ceylon. It is interesting, therefore, to note that from four out of five of the cases above recorded *M. pinoyi* was isolated. In only two of the cases (2 and 3) does the influence of a dusty occupation as to cause of infection seem to be at all possible. In Case 2 the history of the occurrence of pustules on the arms and faces of workers seems suggestive. Attempts to isolate Monilia from a sample of the suspected straw (Case 2) and from the dust of various brands of cigarettes (Case 3) failed.

The clinical picture in no way presents any distinctive feature. The long duration of the signs of pulmonary consolidation is notable, as is the persistence of the fungus in the sputum after the completion of convalescence—a feature indicative of the chronicity of the infection, and perhaps of the possibility of relapse. In the two cases which presented an acute tonsillitis cultures made from the exudate yielded a plentiful growth of *Monilia pinoyi.* It is difficult, however, to exclude the possibility of contamination from the sputum.

FIG. 3.



Creamy-white culture on solid media in test-tube.

Diagnosis.

The diagnosis of bronchomoniliasis is by no means free from difficulty. It depends primarily on the repeated demonstration of the fungus in the sputum. It is essential that specimens should be collected into sterile vessels and washed repeatedly before cultivation. The patient should gargle with sterile saline or with a dilute solution of potassium permanganate before expectorating. In cases of true infection a profuse growth occurs from cultures on Sabouraud's medium. In other cases experience has shown that, even when the preliminary washing of the patient's mouth is neglected, it is exceptional to obtain more than a very scanty growth, and that commonly none at all appears. This fact has been established by the examination and cultivation of a large number of sputa selected at random without reference to the clinical diagnosis. Confirmatory evidence may be sought in other directions.

(*a*) Fixation abscess: *In Case* 2 the hypodermic administration of digitalin resulted on three *occasions in* the production of small abscesses containing *Monilia pinoyi* in pure culture. This *fact* was interpreted as an indication that a true and generalised infection existed. As a further step, small fixation abscesses were produced in Cases 3, 4, and 6 by means of the hypodermic injection of a few minims of oil of turpentine. In Cases 3 and 6 the pus was sterile. *In Case* 4.

however, Monilia was demonstrated in film and grown in pure culture. It would appear, therefore, that this procedure is of some diagnostic value.

(b) There is no record in published cases of resort to blood culture. In view of the possibility of generalisation of the infection, positive results might be expected in some instances. Cultures in sugar-broth media taken from Cases 2 and 3 of the above series proved sterile.

(c) Agglutination and complement-fixation tests are sometimes of value. No evidence of the presence of specific agglutination could be found in the sera of Cases 3 and 4, although after the administration of an autogenous vaccine agglutination occurred in Case 2 in serum dilutions from 1 in 5 to 1 in 50.

(d) In Cases 5 (*M. pinoyi*) and 4 (*M. guillermondi*) an attempt was made to establish the diagnosis by means of cutaneous inoculation of protein isolated from a culture of *Monilia pinoyi*. In neither instance did any reaction occur.

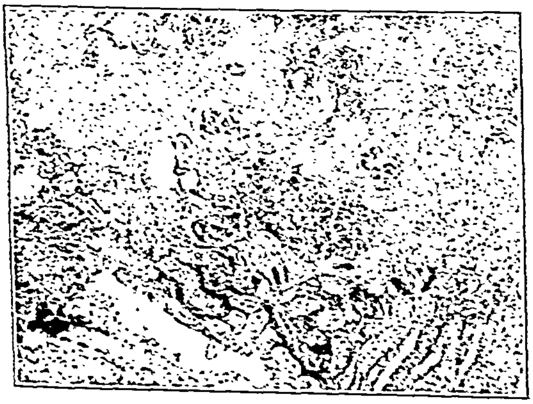
In those cases where the lesion is purely local those methods of investigation which aim at the detection of the organism in the circulation, or which depend on the recognition of specific general reactions, are hardly applicable. There is, however, evidence to suggest that dissemination does occur and that the use of these methods for diagnostic purposes is worthy of trial.

Treatment.

Authorities are unanimous in their opinion that the administration of iodine is beneficial. For oral administration potassium iodide in large doses is sometimes effective, although tinct. iodi. (French Codex) is perhaps a more active preparation. Castellani recommends saiodin (10–20 gr. t.d.s.) in cachet. For intramuscular injection lipiodol in doses of 1–2 c.cm. (0·54–1·08 g. iodine) daily is of use.

In the cases recorded above potassium iodide was administered in doses of from gr. xxx.–lx. per diem. The persistence of Monilia in the sputum after convalescence is due in part to the fact that the patients neglected treatment, and in part no doubt to the relative smallness of the doses ordered. Cases 2 and 4 were given autogenous vaccines in doses of from 10–2000 millions. No reaction of any kind was observed.

FIG. 4.



Miliary lesions resembling tubercles found in kidney of rabbit after intravenous injection of 5 c.cm. of a moderately turbid emulsion of *Monilia pinoyi* culture isolated from Case 2.

Prognosis.

Mild cases tend to recover spontaneously. There seems to be no doubt, however, that efficient treatment is capable of considerably modifying the course of both the mild and the more severe infections, and of producing a rapid improvement in many cases. To avoid, as far as possible, the danger of relapse, the patient should be kept under the influence of iodine for some time after convalescence is complete.

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In conclusion, it is suggested that bronchomoniliasis is of more frequent occurrence in this country than has hitherto been suspected, and that, as the clinical features are in no way distinctive, the investigation of sputa for the presence of fungi will well repay the trouble entailed.

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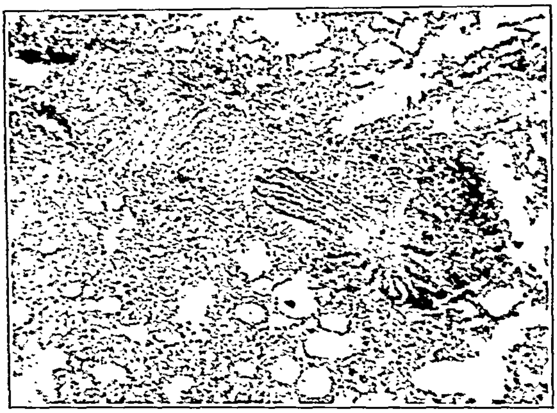

Section of rabbit's lung showing marked peribronchial infiltration and small tubercles, composed chiefly of endothelial and plasma cells and having hyaline non-caseating centres.

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MENTAL TESTS FOR DELINQUENTS,

AND MENTAL CONFLICT AS A CAUSE OF DELINQUENCY.

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AND
G. W. PAILTHORPE, M.B., B.S. Durh.

The first part of this paper deals with the results obtained with the Hamblin Smith scheme of tests[1] on prisoners in Birmingham Prison. Of 750 cases tested during a period of three years, only those have been considered for the purposes of this paper in which a complete examination with these tests was given. This condition has excluded, amongst others, a considerable number of imbeciles. Of these completely examined cases there were 217 men and 108 women. It must be taken into consideration that there were a number of cases remitted for special investigation under the Birmingham scheme,[2] and many of these were prima facie abnormal. No conclusions, therefore, must be drawn from our figures as to the percentage of mental defectives and subnormals amongst our criminals.

Examination of 325 Cases.

The results arrived at after the examination of these 325 persons suggest conclusions which further investigation on a more extensive scale is needed to corroborate. We are, therefore, presenting suggestions and indications rather than statistics. The cases have been grouped under the headings of normal (N), subnormal (S), and mental defective (M.D.). (Table I.)

TABLE I.

	N.	S.	M.D.
Males	106	46	65
Females	45	22	41

Note.—This table must be kept in view throughout. All percentages throughout the paper are calculated on the basis of the figures here given.

The *normal* group needs no special description. The *subnormal* group consists of: (1) Persons considered to be defective in intelligence, in whom the defect is not great enough to warrant placing them in the mentally defective class, or where there was difficulty in establishing the existence of the defect from an early age. (2) Persons in whom the defect in intelligence is complicated by and in some cases brought about by mental conflict. The *mental defective* group are those who are certifiable under the 1913 Mental Deficiency Act—i.e., they present all the criteria of permanent mental defect from an early age, with need for care, supervision, and control for their own protection or the protection of others. Of the total 325 cases all except 28 were under the age of 30 years. The remainder were either subnormal or mentally defective. We have found that mentally normal persons over the age of 30 do not respond well, as a rule, to formal testing. The remaining 297 cases were quite unselected.

The total 325 cases have been classified as under:—

1. Under the headings normal, subnormal, and mental defective: (*a*) Results obtained in each of ten tests, summarised in Table II., are briefly explained and discussed. (*b*) The character of offences committed.

2. The normal and subnormal cases in connexion with mental conflict have been dealt with.

3. A general summing up of the results obtained is given.

TABLE II.—*Summary of Results Obtained in Ten Tests.*

—	Sex.	N.	S.	M.D.
Test 1. Percentage of success ..	M.	97·8	83·7	54·9
	F	100	80·9	69·2
,, 2. Percentage of success ..	M.	96·2	82·6	56·9
	F.	88·8	77·2	43·9
,, 3. Percentage of success ..	M.	92·5	69·9	38·4
	F.	88·8	45·4	21·9
,, 2 and 3 together. Percentage of success	M.	89·6	58·7	23·0
	F.	82·2	31·8	14·6
,, 4. Percentage found suggestible	M.	44·6	60·9	62·3
	F.	33·3	50·0	52·8
,, 5. Percentage of success ..	M.	90·4	57·7	20·0
	F.	95·5	68·1	20·5
,, 6. Percentage found suggestible	M.	41·7	32·9	65·1
	F.	15·6	31·9	35·0
,, 7. Percentage of superior plan	M.	68·0	39·1	17·5
	F.	53·4	30·0	5·4
,, 8. Percentage of success ..	M.	86·6	64·9	61·2
	F.	89·2	62·1	48·5
,, 9. Percentage of success ..	M.	71·7	30·2	15·6
	F.	51·1	19·0	5·4
,, 10. Percentage of very good, good, or fair	M.	93·0	81·4	20·9
	F.	81·2	66·6	31·0

Details of Tests.

Test 1. *Money Change.*—In this test the subject is asked simple questions such as: If your fare on a tram were 2½*d.* and you gave the conductor a 2*s.* piece, what change should you get? If you buy 1 lb. of bacon at 1*s.* 5*d.* the pound, what change should you have out of half-a-crown? "A kind of problem that must be solved if a subject is to live at all in the ordinary world." The gradation is definitely downwards; but it is to be noted that rather more than half the mentally defective are able to pass this test. The normal female shows a slightly better result than the normal male. This is probably due to the fact that women do the marketing and are, therefore, more constantly having to use this form of mental activity than the male.

Test 2. *First Form Board* (*Healy*).—The board is a rectangular frame into which exactly fit five blocks. It is a test of attention, perseverance, perception of form relationship and the ability to plan a simple piece of work. Again, the gradation is downwards. The males show a better result than the females. Since men are frequently engaged in work such as carpentry, brick-laying, plumbing, van-loading, road-making, &c., all of which require some skill in planning and fitting, it may be concluded that the difference is again, probably, due to occupation. The same variation is evident also in the second form board and in both boards taken together.

Test 3. *Second Form Board* (*Hamblin Smith*).—This is similar to the first form board test but more difficult, requiring a higher degree of intelligence to accomplish it. As we should expect, the gradation is very much more marked. Where 56·9 per cent. of mental defectives among the males were able to do the first form board, only 38·4 per cent. were able to do the second form board. Among the females the percentage for the first form board is 43·9 as against 21·9 for the second. Taking Tests 2 and 3 together we see that the percentage in the mental defective group is very much lower. The two tests, especially when taken together, form decidedly good discriminating tests for mental defect.

Test 4. *Aussage.*—A test of attention, observation, memory, and suggestibility. The subject is given a brightly coloured picture, being told to observe carefully all that he sees therein. After 20 seconds the picture is taken away, and he is told to give a full description of everything that he has noticed. After having exhausted these memories the examiner suggests certain objects as having been in the picture, and notice is taken as to whether the subject accepts these suggestions or not. The table shows the percentages of those found to be suggestible. *It will be noted that suggestibility rises with the decline of intelligence*, also that the males show a slightly greater degree of suggestibility than do the females.

Test 5. *Interpretation of Pictures* (*Terman*).—This is a test of apperception, recognition of a situation presented visually, and imagination. Two pictures are given in turn to the subject, and he is asked to give an interpretation of their meaning. The descent is very marked, and the test is correspondingly valuable. The females make a slightly better show than the males, perhaps indicating a slightly greater power of imagination.

Test 6. *Comparison of Lines* (*Binet*).—*A test of suggestibility.* Three pairs of unequal lines, the longer being, in each case, on the right-hand side, followed by three pairs of equal lines, are presented to the subject in succession. The suggestible subject is liable, because of the repetition in the first three pairs of the longer line being on the right-hand side, to see a longer line on the right-hand side in the case of the equal pairs also. There is a marked increase of suggestibility in the mentally defective class. *As in Test 4*, the males show a greater degree of suggestibility than the females. This difference may be due to the more secluded life of the female of the type with whom we are dealing and to her more guarded contact with the outer world; the male, who is more accustomed to meet other people, is less suspicious.

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[1] The Psychology of the Criminal, Hamblin Smith, Chapter 2.

[2] The Medical Examination of Delinquents, Journal of Mental Science, July, 1922.

TEST 7. *Cricket Ball* (*Terman*).—A circle of about 3 inches in diameter, with a gap to represent a gate, is presented to the subject. He is asked to suppose he has lost a ball or a purse in this field, and to draw a line from the gate indicating the path he would take in order to find the lost object. The test is one of ability to grasp essentials, to comprehend simple directions, and to make a plan. The result may be a superior plan, an inferior plan, or no plan at all. Table II. shows the percentage able to produce a superior plan. The descent is very marked and the test very valuable. Males are better than females, probably for the same reasons as in Tests 1 and 2.

TEST 8. *Apperception Test* (*Heilbronner*).—This consists of eight sets of cards, each successive card in the set showing rather more detail in the representation of some common object (lamp, bicycle, &c.), until the complete object is shown in the final card. The cards in each set are presented in their order, and a note is made of the point at which the subject names correctly the object shown. A success is scored when the subject recognises the object in at least five of the eight sets before more than half the cards in each set have been shown. Apperception is naturally less strong in the subnormals and the mentally defective. The difference between the sexes is not appreciable.

TEST 9. *Pictorial Completion Test* (*Healy*).—A test demanding mental control, association, imagination, and apperception. It consists of a brightly coloured picture, mounted on wood, and in which 10 1-inch squares have been cut out. The subject is given the picture and 45 blocks, each 1 inch square, of which 40 bear a representation of some object, while the other five are blanks. He is required to fill in the picture with the blocks which, in his opinion, make the best sense. Care is taken to see that he thoroughly understands what he has to do by means of the demonstration of the correct filling of one space by the examiner. The subject is then left to complete the picture by himself. A note is made of final errors, logical and illogical, the latter being errors for which the subject can give no reasonable explanation. The gradation is very marked, and this pictorial completion forms a most excellent discriminating test. The opinion expressed in "Psychology of the Criminal," p. 42, that an absolutely complete success in this test excludes mental defect, still holds good. In our present figures, however, we have scored more leniently, allowing a wrong window, a wrong bird, and a pumpkin instead of a ball to count as logical and a pass.

TEST 10. *Information*.—A test of general current knowledge, involving simple questions such as the name of the King and the Prince of Wales, the names of four or five large cities in England, the cause of the Great War and the date of its commencement, the names of our allies and those of Germany, and so on. This table includes cases whose information was scored as "very good, "good," or "fair." The results are as expected. There is a great falling off in the mentally defective class. Here, again, the males are better than the females, a result we should expect, since men, by reason of their manifold occupations, are brought in contact with the outer world, whereas the women of the class from which we draw our offenders are often occupied at home.

Summing up the results obtained on the ten tests. Table III. shows the averages of failures in each case. These averages rise rapidly in the subnormal and mentally defective groups.

TABLE III.—*Showing Averages of Failures in each of the Tests.*

—		N.	S.	M.D.
Males ..	No. of cases..	106	46	65
	No. of failures	198	197	552
	Average per person ..	1·88	4·37	8·76
Females	No. of cases..	45	22	41
	No. of failures	101	121	333
	Average per person ..	2·24	5·5	8·1

Table III. also shows the averages in the normal and the subnormal classes on the male side to be better than on the female side. This is what we should expect, since Tests 2, 3, 6, 7, 8, and 9 give in each case a better result for the male, an explanation of which has been suggested on occupational grounds. In Tests 1 and 5 the female is better than the male, probably from the same cause. In Tests 4 and 6 it should be noted that the males are more suggestible than the females.

We venture to think that, for reasons set out in detail in the "Psychology of the Criminal," pp. 46-8, this scheme of tests possesses certain advantages over the well-known Terman scheme, as well as avoiding certain possible fallacies, especially for use with subjects between the ages of 16 and 30 years. The tests require little facility in the use of language, and are, therefore, very useful when we deal with the subnormal or defective "verbalist" type.[3]

Classification of Offences.

Classifying the cases under offences, we have divided them into four groups:—

(*a*) *Larceny.*—Offences of dishonesty of every kind, from trivial stealing to obtaining money on false pretences.

(*b*) *Sex.*—The character of offences in this class on the part of the males is largely that of indecent exposure and indecent assault, whereas in the female the offence in most cases is that of solicitation. That is to say, that while in the male the offence is purely sexual in character, in the female the offence is activated largely, and in some cases solely, by economic reasons.

(*c*) *Vagrancy.*—This includes all such offences as begging and wandering without visible means of support.

(*d*) *Miscellaneous.*—A comparatively small group, including drunkenness, violence, attempted suicide, &c.

Table IV. shows the percentages of cases arranged under each group.

TABLE IV.—*Showing the Percentage of Cases arranged under each Group.*

—		N.	S.	M.D.
Males ..	Larceny	68·9	50·0	41·5
	Sex	20·8	21·7	26·2
	Vagrancy	7·2	13·0	21·5
	Other offences	3·1	15·3	10·8
Females	Larceny	52·2	38·1	25·0
	Sex	13·5	28·8	25·0
	Vagrancy	10·5	4·1	27·5
	Other offences	23·8	28·0	22·5

The great preponderance of larceny and sex offences over all others is clearly seen. These two offences will always provide the vast majority of the cases to be investigated.

The Factor of Mental Conflict.

We now take the normal and subnormal groups, and give below in Table V. the percentage of cases in which the offence committed was due to mental conflict. No conclusions, however, as to the incidence of mental conflict as a cause of delinquency must be drawn from these figures, since many of these cases were sent for special observation. Further, some of the cases were not examined sufficiently deeply to ascertain whether mental conflict were present or not. The short period of detention of many of the subjects, as well as on our part the lack of the necessary time, have been obstacles to deeper and more extensive investigation. But we have often gone far enough to see that a mental conflict, deserving fuller investigation, is a prominent factor in many cases. And we feel that mental conflict is the most important single cause of delinquency amongst the normal and subnormal offenders.

TABLE V.—*Mental Conflict Cases.*

	N.		S.
Males	32·0	....	41·3
Females	33·3	....	13·6

The figures in Table V. represent altogether 70 mental conflict cases; and these, under the head of offences, are divided up as below: larceny, 50 per cent.; sex, 28·3 per cent.; other offences, 21·7 per cent. In dealing with these cases we have found without exception that the conflict has been of a sex nature, although the offence committed may be of an entirely different character—e.g., stealing, violence, drunkenness, &c. As an example, a woman was brought up

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[3] Healy: "The Individual Delinquent," pp. 501, ff.

MENTAL TESTS FOR DELINQUENTS,

AND MENTAL CONFLICT AS A CAUSE OF DELINQUENCY.

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THE first part of this paper deals with the results obtained with the Hamblin Smith scheme of tests[1] on prisoners in Birmingham Prison. Of 750 cases tested during a period of three years, only those have been considered for the purposes of this paper in which a complete examination with these tests was given. This condition has excluded, amongst others, a considerable number of imbeciles. Of these completely examined cases there were 217 men and 108 women. It must be taken into consideration that there were a number of cases remitted for special investigation under the Birmingham scheme,[2] and many of these were prima facie abnormal. No conclusions, therefore, must be drawn from our figures as to the percentage of mental defectives and subnormals amongst our criminals.

Examination of 325 Cases.

The results arrived at after the examination of these 325 persons suggest conclusions which further investigation on a more extensive scale is needed to corroborate. We are, therefore, presenting suggestions and indications rather than statistics. The cases have been grouped under the headings of normal (N), subnormal (S), and mental defective (M.D.). (Table I.)

TABLE I.

	N.	S.	M.D.
Males	106	46	65
Females	45	22	41

Note.—This table must be kept in view throughout. All percentages throughout the paper are calculated on the basis of the figures here given.

The *normal* group needs no special description. The *subnormal* group consists of: (1) Persons considered to be defective in intelligence, in whom the defect is not great enough to warrant placing them in the mentally defective class, or where there was difficulty in establishing the existence of the defect from an early age. (2) Persons in whom the defect in intelligence is complicated by and in some cases brought about by mental conflict. The *mental defective* group are those who are certifiable under the 1913 Mental Deficiency Act—i.e., they present all the criteria of permanent mental defect from an early age, with need for care, supervision, and control for their own protection or the protection of others. Of the total 325 cases all except 28 were under the age of 30 years. The remainder were either subnormal or mentally defective. We have found that mentally normal persons over the age of 30 do not respond well, as a rule, to formal testing. The remaining 297 cases were quite unselected.

The total 325 cases have been classified as under:—

1. Under the headings normal, subnormal, and mental defective: (*a*) Results obtained in each of ten tests, summarised in Table II., are briefly explained and discussed. (*b*) The character of offences committed.

2. The normal and subnormal cases in connexion with mental conflict have been dealt with.

3. A general summing up of the results obtained is given.

Details of Tests.

TEST 1. *Money Change.*—In this test the subject is asked simple questions such as: If your fare on a tram were 2½*d.* and you gave the conductor a 2*s.* piece, what change should you get? If you buy 1 lb. of bacon at 1*s.* 5*d.* the pound, what change should you have out of half-a-crown? "A kind of problem that must be solved if a subject is to live at all in the ordinary world." The gradation is definitely downwards; but it is to be noted that rather more than half the mentally defective are able to pass this test. The normal female shows a slightly better result than the normal male. This is probably due to the fact that women do the marketing and are, therefore, more constantly having to use this form of mental activity than the male.

TABLE II.—*Summary of Results Obtained in Ten Tests.*

—		Sex.	N.	S.	M.D.
Test 1.	Percentage of success ..	M.	97·8	83·7	54·9
		F	100	80·9	69·2
,, 2.		M.	96·2	82·6	56·9
		F.	88·8	77·2	43·9
,, 3.		M.	92·5	69·9	38·4
		F.	88·8	45·4	21·9
,, 2 and 3 together.	Percentage of success	M.	89·6	58·7	23·0
		F.	82·2	31·8	14·6
,, 4.	Percentage found suggestible	M.	44·6	60·9	62·3
		F.	33·3	50·0	52·8
,, 5.	Percentage of success ..	M.	90·4	57·7	20·0
		F.	95·5	68·1	20·5
,, 6.	Percentage found suggestible	M.	41·7	32·9	65·1
		F.	15·6	31·9	35·0
,, 7.	Percentage of superior plan	M.	68·0	39·1	17·5
		F.	53·4	30·0	5·4
,, 8.	Percentage of success ..	M.	86·6	64·9	61·2
		F.	89·2	62·1	48·5
,, 9.		M.	71·7	30·2	15·6
		F.	51·1	19·0	5·4
,, 10.	Percentage of very good, good, or fair	M.	93·0	81·4	20·9
		F.	81·2	66·6	31·0

TEST 2. *First Form Board* (*Healy*).—The board is a rectangular frame into which exactly fit five blocks. It is a test of attention, perseverance, perception of form relationship and the ability to plan a simple piece of work. Again, the gradation is downwards. The males show a better result than the females. Since men are frequently engaged in work such as carpentry, brick-laying, plumbing, van-loading, road-making, &c., all of which require some skill in planning and fitting, it may be concluded that the difference is again, probably, due to occupation. The same variation is evident also in the second form board and in both boards taken together.

TEST 3. *Second Form Board* (*Hamblin Smith*).—This is similar to the first form board test but more difficult, requiring a higher degree of intelligence to accomplish it. As we should expect, the gradation is very much more marked. Where 56·9 per cent. of mental defectives among the males were able to do the first form board, only 38·4 per cent. were able to do the second form board. Among the females the percentage for the first form board is 43·9 as against 21·9 for the second. Taking Tests 2 and 3 together we see that the percentage in the mental defective group is very much lower. The two tests, especially when taken together, form decidedly good discriminating tests for mental defect.

TEST 4. *Aussage.*—A test of attention, observation, memory, and suggestibility. The subject is given a brightly coloured picture, being told to observe carefully all that he sees therein. After 20 seconds the picture is taken away, and he is told to give a full description of everything that he has noticed. After having exhausted these memories the examiner suggests certain objects as having been in the picture, and notice is taken as to whether the subject accepts these suggestions or not. The table shows the percentages of those found to be suggestible. It will be noted that suggestibility rises with the decline of intelligence, also that the males show a slightly greater degree of suggestibility than do the females.

TEST 5. *Interpretation of Pictures* (*Terman*).—This is a test of apperception, recognition of a situation presented visually, and imagination. Two pictures are given in turn to the subject, and he is asked to give an interpretation of their meaning. The descent is very marked, and the test is correspondingly valuable. The females make a slightly better show than the males, perhaps indicating a slightly greater power of imagination.

TEST 6. *Comparison of Lines* (*Binet*).—A test of suggestibility. Three pairs of unequal lines, the longer being, in each case, on the right-hand side, followed by three pairs of equal lines, are presented to the subject in succession. The suggestible subject is liable, because of the repetition in the first three pairs of the longer line being on the right-hand side, to see a longer line on the right-hand side in the case of the equal pairs also. There is a marked increase of suggestibility in the mentally defective class. As in Test 4, the males show a greater degree of suggestibility than the females. This difference may be due to the more secluded life of the female of the type with whom we are dealing and to her more guarded contact with the outer world; the male, who is more accustomed to meet other people, is less suspicious.

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[1] The Psychology of the Criminal, Hamblin Smith, Chapter 2.

[2] The Medical Examination of Delinquents, Journal of Mental Science, July, 1922.

TEST 7. *Cricket Ball* (*Terman*).—A circle of about 3 inches in diameter, with a gap to represent a gate, is presented to the subject. He is asked to suppose he has lost a ball or a purse in this field, and to draw a line from the gate indicating the path he would take in order to find the lost object. The test is one of ability to grasp essentials, to comprehend simple directions, and to make a plan. The result may be a superior plan, an inferior plan, or no plan at all. Table II. shows the percentage able to produce a superior plan. The descent is very marked and the test very valuable. Males are better than females; probably for the same reasons as in Tests 1 and 2.

TEST 8. *Apperception Test* (*Heilbronner*).—This consists of eight sets of cards, each successive card in the set showing rather more detail in the representation of some common object (lamp, bicycle, &c.), until the complete object is shown in the final card. The cards in each set are presented in their order, and a note is made of the point at which the subject names correctly the object shown. A success is scored when the subject recognises the object in at least five of the eight sets before more than half the cards in each set have been shown. Apperception is naturally less strong in the subnormals and the mentally defective. The difference between the sexes is not appreciable.

TEST 9. *Pictorial Completion Test* (*Healy*).—A test demanding mental control, association, imagination, and apperception. It consists of a brightly coloured picture, mounted on wood, and in which 10 1-inch squares have been cut out. The subject is given the picture and 45 blocks, each 1 inch square, of which 40 bear a representation of some object, while the other five are blanks. He is required to fill in the picture with the blocks which, in his opinion, make the best sense. Care is taken to see that he thoroughly understands what he has to do by means of the demonstration of the correct filling of one space by the examiner. The subject is then left to complete the picture by himself. A note is made of final errors, logical and illogical, the latter being errors for which the subject can give no reasonable explanation. The gradation is very marked, and this pictorial completion forms a most excellent discriminating test. The opinion expressed in "Psychology of the Criminal," p. 42, that an absolutely complete success in this test excludes mental defect, still holds good. In our present figures, however, we have scored more leniently, allowing a wrong window, a wrong bird, and a pumpkin instead of a ball to count as logical and a pass.

TEST 10. *Information*.—A test of general current knowledge, involving simple questions such as the name of the King and the Prince of Wales, the names of four or five large cities in England, the cause of the Great War and the date of its commencement, the names of our allies and those of Germany, and so on. This table includes cases whose information was scored as "very good, "good," or "fair." The results are as expected. There is a great falling off in the mentally defective class. Here, again, the males are better than the females, a result we should expect, since men, by reason of their manifold occupations, are brought in contact with the outer world, whereas the women of the class from which we draw our offenders are often occupied at home.

Summing up the results obtained on the ten tests, Table III. shows the averages of failures in each case. These averages rise rapidly in the subnormal and mentally defective groups.

TABLE III.—*Showing Averages of Failures in each of the Tests.*

—		N.	S.	M.D.
Males ..	No. of cases..	106	46	65
	No. of failures	198	197	552
	Average per person ..	1·88	4·37	8·76
Females	No. of cases..	45	22	41
	No. of failures	101	121	333
	Average per person ..	2·24	5·5	8·1

Table III. also shows the averages in the normal and the subnormal classes on the male side to be better than on the female side. This is what we should expect, since Tests 2, 3, 6, 7, 8, and 9 give in each case a better result for the male, an explanation of which has been suggested on occupational grounds. In Tests 1 and 5 the female is better than the male, probably from the same cause. In Tests 4 and 6 it should be noted that the males are more suggestible than the females.

We venture to think that, for reasons set out in detail in the "Psychology of the Criminal," pp. 46-8, this scheme of tests possesses certain advantages over the well-known Terman scheme, as well as avoiding certain possible fallacies, especially for use with subjects between the ages of 16 and 30 years. The tests require little facility in the use of language, and are, therefore, very useful when we deal with the subnormal or defective "verbalist" type.[3]

Classification of Offences.

Classifying the cases under offences, we have divided them into four groups:—

(*a*) *Larceny.*—Offences of dishonesty of every kind, from trivial stealing to obtaining money on false pretences.

(*b*) *Sex.*—The character of offences in this class on the part of the males is largely that of indecent exposure and indecent assault, whereas in the female the offence in most cases is that of solicitation. That is to say, that while in the male the offence is purely sexual in character, in the female the offence is activated largely, and in some cases solely, by economic reasons.

(*c*) *Vagrancy.*—This includes all such offences as begging and wandering without visible means of support.

(*d*) *Miscellaneous.*—A comparatively small group, including drunkenness, violence, attempted suicide, &c.

Table IV. shows the percentages of cases arranged under each group.

TABLE IV.—*Showing the Percentage of Cases arranged under each Group.*

—		N.	S.	M.D.
Males ..	Larceny	68·9	50·0	41·5
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Females	Larceny	52·2	38·1	25·0
	Sex	13·5	28·8	25·0
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The great preponderance of larceny and sex offences over all others is clearly seen. These two offences will always provide the vast majority of the cases to be investigated.

The Factor of Mental Conflict.

We now take the normal and subnormal groups, and give below in Table V. the percentage of cases in which the offence committed was due to mental conflict. No conclusions, however, as to the incidence of mental conflict as a cause of delinquency must be drawn from these figures, since many of these cases were sent for special observation. Further, some of the cases were not examined sufficiently deeply to ascertain whether mental conflict were present or not. The short period of detention of many of the subjects, as well as on our part the lack of the necessary time, have been obstacles to deeper and more extensive investigation. But we have often gone far enough to see that a mental conflict, deserving fuller investigation, is a prominent factor in many cases. And we feel that mental conflict is the most important single cause of delinquency amongst the normal and subnormal offenders.

TABLE V.—*Mental Conflict Cases.*

	N.	S.
Males	32·0	41·3
Females	33·3	13·6

The figures in Table V. represent altogether 70 mental conflict cases; and these, under the head of offences, are divided up as below: larceny, 50 per cent.; sex, 28·3 per cent.; other offences, 21·7 per cent. In dealing with these cases we have found without exception that the conflict has been of a sex nature, although the offence committed may be of an entirely different character—e.g., stealing, violence, drunkenness, &c. As an example, a woman was brought up before the courts on the charge of wilful destruction of public property; analysis proved the meaning of the act to be an attempt at expression on the part of a repressed complex which had originated in a sex experience many years before. The act was, in fact, an attempt on the part of the patient at protection against her unconscious. It is, moreover, to be noticed that sexual offences in the male, such as indecent behaviour, are, in the female, where repression of sex impulses has been more generally practised, often substituted by other offences, such as violence, attempted suicide, drunkenness, &c.

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[3] Healy: "The Individual Delinquent," pp. 501, ff.

In summing up, therefore, we venture to think that our findings indicate at least one thing—that is, the enormous importance of conflict as a cause of delinquency. We are well aware that there is much that is highly controversial in this subject, and that very diverse views are held as to the precise mechanism and character of conflict and repression, and the manner of its operation. Into this controversy it is not our intention to enter. Nor does it greatly matter, from a practical point of view, which particular theory is adopted. It is the effect of repression and conflict which concerns us. And upon this there is more unanimity of opinion. To take an example from a somewhat cognate subject. There are great divergences of view as to the mechanism of production of dementia præcox; but there is no difficulty in the recognition of well-marked cases of that condition. Nor is there divergence of opinion as to the way in which these cases are to be dealt with. So with repression and conflict. Until such time as the present controversies have composed themselves, it is open to us to adopt any of the varying views. But there can be no doubt as to the importance of the condition. Nor can there be uncertainty as to the desirability of proper psychological investigation and treatment of this condition, nor the failure of our present methods in this respect. And the recognition of the importance of this condition as a cause of delinquency in no way implies that the subjects thereof are to be simply allowed to do whatever they please. The welfare of society is of supreme importance. Our point is that these cases require treatment, in the interests of society as well as in their own, and that this treatment must be on special lines.

What is wanted is: (*a*) Recognition of these conflict cases by means of full investigation before trial; (*b*) appreciation by the courts of the value and the necessity of the treatment of these cases of conflict; (*c*) provision of means of treating these cases by (1) proper institutions, (2) perhaps some form of indeterminate sentence.

The willingness of the patient is essential for the treatment, for which reason we think that the probation system might well be combined, in certain of these cases, with remedial measures. The submission to such measures could be made a condition of probation. But this involves institutions at which, and practitioners by whom, this treatment can be carried out.

The publication of this paper, as expressing our personal views, is approved by the Prison Commissioners.

RENDLESHAM HALL, SUFFOLK.—The new sanatorium for the residential treatment of alcoholism and drug addiction, which was described in THE LANCET of May 5th last, is now in full working order, and a descriptive booklet has been issued which gives full particulars of the conditions under which the treatment, founded on voluntary lines with an eye to the physical comfort and general well-being of the patient, is carried out. How exactly suitable these conditions are is shown by the illustrations of sumptuous interiors and the charming prospects of beautiful old trees, delightful walks, and well-kept gardens. There is also every facility for indoor recreations. Rendlesham Hall stands in 270 acres of its own grounds and in the centre of some 5000 acres of preserved land, full of game, and is an ideal place for the purpose for which it is intended, having all the charm of a large country mansion with effective medical treatment on the spot. The London offices are at 20, Ridge road, Stroud Green, London, N.8, from where the pamphlet can be obtained from the Secretary of Norwood Sanatorium, Limited.

THE INTER-RELATIONSHIP OF BLOOD-FAT AND BLOOD-SUGAR.

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THE presence of lipæmia and acetonuria in nearly all conditions in which there is a disturbance of carbohydrate metabolism has suggested to many observers the intimate relationship of the fat and sugar in the body. Whether ketosis can be explained entirely by a deficiency of oxidising carbohydrate, or whether it is due also to a disturbance of a physical or chemical combination of the two substances, is a problem which has yet to be solved. Some years ago Newburgh and Marsh[1] demonstrated the ease with which ketosis may clear up in certain cases of diabetes, in spite of a high fat dietary, and we have observed in several cases of severe diabetes an almost complete disappearance of acetonuria where the sole dietary has consisted of 3 oz. of cod-liver oil daily. In one instance the daily acetone excretion fell from 3 to 0·2 g. within six days and was accompanied by a rise in the alveolar CO_2 and a general amelioration of the patient's condition. These phenomena are difficult of explanation if carbohydrate be looked upon as a necessary fuel for the combustion of fat. *On the other hand, excess of fat in the diabetic dietary is a frequent source of glycosuria, as has been pointed out by Allen, and it was noticeable in our own cases, above mentioned, that the glycosuria took much longer to clear up than with starvation alone, in spite of the rapid fall of acetone excretion.*

There is some experimental evidence of an inter-relationship between the two substances. Biedl many years ago produced glycosuria by ligature of the thoracic duct, and though the experiment has been confirmed by others the result has been variously attributed to nervous irritation, an interference with a pancreatic secretion travelling via the duct, or to a disturbance of fat metabolism. The occasional coincidence of chyluria and glycosuria in man suggests, however, that the last explanation is the more probable. In one such case under the care of Dr. G. R. Murray, which we had the opportunity of observing, these symptoms appeared to be associated with a disturbance of liver function, as they were accompanied by temporary enlargement of that organ and by jaundice. Again, in phosphorus poisoning, where there is much disturbance of fat metabolism, the liver appears to be unable to store injected dextrose as glycogen. De Fillipi showed that sugar is less well tolerated by a starving than by a well-fed dog, and lactose is better tolerated when given in milk than when taken alone. Cramer found also that the administration of lard along with sugar raises the limit of tolerance.[2]

Of the physiology of fat after reaching the blood stream little is known. Apparently it enters into some combination from which it cannot be extracted by ordinary solvents, the so-called "masking" of fat; but a direct combination with glucose has never been proved, although a compound of mannitol and a fatty acid has been synthesised in the laboratory.

Method of Experiment.

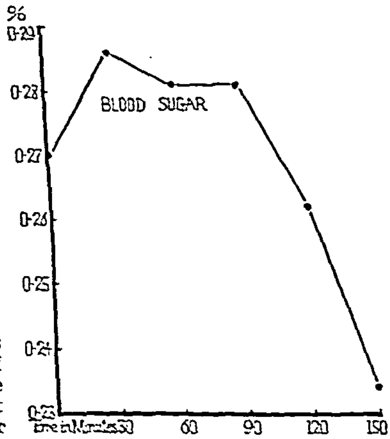
The following experiments were made with a view to investigating this relationship. The problem is difficult and did not appear to be one which could be attacked by animal experiments, as both fright and anæsthetics may raise the blood-sugar considerably. As Allen has shown that glucose given intravenously behaves differently from that absorbed from the intestine, oral administration only was resorted to, the experiments being made chiefly on ourselves so that the diet could be controlled as far as possible. The blood-sugar was estimated by Maclean's method and the blood-fat by Bloor's, both of which are sufficiently well known as to require no further mention here. It is noticeable that considerable variations were found in the amount of blood-fat in spite of prolonged fasting. Control experiments were made: in the estimation of blood-sugar the error was found to be negligible; in the estimation of blood-fat it was not greater than 5 per cent.

In a normal subject after 50 g. of glucose the blood-sugar curve rises to 0·17–0·2 and falls to normal or below in 60 to 90 minutes. As Maclean has pointed out, sugar is still being absorbed from the intestine at the end of that period, but apparently some mechanism has been brought into action which stores the sugar as soon as it has been assimilated, and, within limits, the rise of the blood-sugar curve appears to be independent of the nature or quantity of carbohydrate taken (except lævulose). We have noted that if an ounce of fat or alcohol be taken an hour before a dose of 50 g. of glucose, although there may be some delay in the beginning of the rise of the curve—presumably owing to a retarded passage through the stomach—yet once the rise has started it follows a normal curve, much as when glucose alone has been taken. It seems reasonable to deduce, therefore, that the blood-sugar curve should be regarded as an indication of the capacity for storage rather than as a measure of the rate of absorption from the intestine. Variation in the rate of absorption is, however, a source of error in all these experiments and is unavoidable, but as all were done on an empty stomach and were frequently repeated we believe it has been reduced to a minimum.

The Effect of Fat on Blood-Sugar.

If fat be taken there can usually be observed a marked fall in the blood-sugar. Fig. 1 shows the effect of 1 oz. of butter on a diabetic who had fasted for 12 hours previously. This fact has been observed by Cammidge and his co-workers[3] and has been confirmed by us on numerous occasions. There appear to be two possible explanations of this effect of fat on the blood-sugar: either there was increased use of sugar to oxidise the excess of fat in the blood, or some inhibitory mechanism has been brought into play, leading to an increased storage of carbohydrate.

FIG. 1.



Effect of 1 oz. of butter on the blood-sugar of a diabetic.

The Effect of Fat on Adrenalin Hyperglycæmia.

A hypodermic injection of 20 minims of adrenalin invariably produced a bigger rise of blood-sugar if fat had been taken previously, the subject and the diet on each occasion being identical. The longer the interval between the taking of the fat and the injection of adrenalin, the greater the rise. This was particularly noticeable after cod-liver oil, which is known to be absorbed more rapidly than any other form of fat. Table I. shows the results obtained.

These results appear to indicate an increased storage of carbohydrate after fat has been taken.

TABLE I.

		Maximum rise of blood-sugar.
(1)	No fat	0·16
(2)	„ „	0·159
(3)	75 c.cm. cod-liver oil 1 hour previously ..	0·164
(4)	75 „ olive „ 3 hours „ ..	0·21
(5)	75 „ „ „ 3 „ „ ..	0·198
(6)	75 „ cod-liver „ 3 „ „ ..	0·242

Three possible explanations suggested themselves to us to account for the increased storage: (*a*) The direct conversion of fat into carbohydrate; (*b*) the use of fat as a source of energy, thus sparing the carbohydrate stores; (*c*) some action of the fat on the storage of carbohydrate.

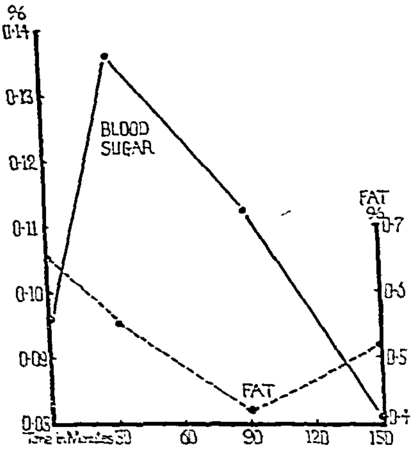
Of these the first seems improbable; even if so complicated a chemical reaction does occur, the time between the taking of the fat and the injection of adrenalin appears too short for the transformation to have taken place. In addition, the feeding of fat to a phloridzinised or depancreatised dog has been shown to produce no increase of glycosuria. With regard to the other explanations, both appear possible; the following experiments, however, seemed to show that the fat may take a more active part in the storage of carbohydrate.

The Effect of Sugar on Blood-Fat.

We have shown that fat diminished the sugar in the blood; we next investigated the effect of sugar on the blood-fat and found it produced a diminution of the latter. Sometimes the fat curve rose again after the sugar was absorbed (Fig. 2); occasionally it reached a higher point than when the experiment was commenced. Sometimes it produced a continuous fall of blood-fat. Table II. shows some of the results obtained after a dose of 50 g. of glucose. The experiments were done 7 to 18 hours after a meal, and as we found by control experiments that the blood-fat fell to normal after the sixth hour, there can be no question of absorption from the intestine. It was not a concentration effect, as the hæmoglobin remained constant throughout.

Excess of sugar, therefore, appears to have a considerable, if temporary, effect on the amount of extractable fat in the blood.

FIG. 2.



Effect of 50 g. of glucose on the blood-fat.

Effect of Calcium Salts.

By giving large doses of calcium salts (100 gr. of either the lactate or chloride) we were able temporarily to increase the acetone in the urine both in normal and diabetic subjects. Usually this was considerable, but occasionally it did not occur in certain of the more severe cases of diabetes. Allen and Wishart[4] were unable to find any increase of blood-fat on giving calcium salts to dogs. We found invariably, however, that calcium salts raised the blood-fat both in normal and diabetic persons. We were able to produce this after fasting for 18 hours; the effect, therefore, was not due to an increased absorption from the intestine. As the blood-sugar and hæmoglobin were not increased, this was not a concentration effect, nor did it appear to be due to an inhibition or oxidation of the fat by the blood-sugar, as if that were so one

TABLE II.

Subject.	Duration of fast before expt.	Commencement.	1 hr. later.	2 hrs. later.
	Hours.	Per cent.	Per cent.	Per cent.
T.H.O. ..	7	0·630	0·420	0·520
" ..	8	0·589	0·470	0·459
A.H.	18	0·518	0·476	0·614
T.H.O. ..	8	0·320	0·260	0·310
A.H.	18	0·363	0·357	0·351
T.H.O. ..	18	0·416	0·375	0·233

would expect an accumulation of the latter. The increase of fat appears to be due either to a liberation of compound which had previously masked the fat, or to a mobilisation from the tissues. The association of a temporary lipæmia with an acetonuria after calcium salts seems to show that the latter is not due to an increase of the permeability of the kidney as we had at first supposed. Table III. gives some results.

TABLE III.

Subject.	Duration of fast before expt.	Commencement.	1 hr. later.	2½ hrs. later.
	Hours.	Per cent.	Per cent.	Per cent.
T.H.O. ..	8	0·390	0·420	0·595
" ..	8	0·320	0·320	0·730
" ..	8	0·480	0·390	0·515
" ..	18	0·346	0·349	0·430
Diabetic ..	8	1·24	1·46	1·30
A.H.	8	0·516	0·590	—
T.H.O. ..	8	0·412	0·488	0·329

If 50 g. of glucose be given three hours after 100 gr. of calcium the blood-sugar curve was found to be higher than normal, usually rising to 0·2 per cent. or over, and failing to return to the previous figure in 1½ hours; sometimes it had not become normal in two hours' time. We also found that if the blood-fat had been raised by a dose of calcium it was not lowered by 50 g. of glucose as in Table II. This suggests that the blood-fat had been altered in some manner, so interfering with the mechanism of storage. In a mild diabetic who had been free from sugar for over a year 100 gr. of calcium so altered his metabolism that he was unable to take any carbohydrate without becoming glycosuric, although previously he had been able to take 2 oz. of white bread daily with impunity. This condition was transient and returned to normal in a fortnight's time.

Calcium has been shown by Clowes to be intimately concerned with the surface-tension of fat and can convert an emulsion of fat in water into one of water in fat. A possible explanation of the above experiment is some alteration of the surface-tension of the blood-fat diminishing permeability into the tissues in much the same way as it is known to affect the permeability of the kidney.

The Effect of Fat on the Blood-sugar Curve.

If fat be taken in considerable quantities (75 c.cm. of cod-liver oil or olive oil) 4 to 12 hours before 50 g. of glucose, so that when the latter is given the blood is flooded with fat, or if the sugar be suspended in fat, a marked prolongation of the sugar-curve results; the rise is usually greater than normal, often up to 0·24 per cent., and this usually has failed to return to normal in two hours, assuming at times almost diabetic proportions. Excess of free fat in the blood, therefore, appears to interfere with the absorption of glucose by the tissues. We have repeated this experiment many times, as our results appear to be the direct opposite of those of Labbé and Theodoresco, who found that fat diminished the rise of the blood-sugar curve.[5] If, however, a large quantity of fat be taken 18 to 24 hours before the dose of glucose, thus allowing it to be assimilated into the tissues, this effect is not seen; on the contrary, we have noted a more rapid fall of the blood-sugar under these circumstances.

Discussion of Results.

Although the results obtained cannot be looked on as conclusive, and are probably affected to some extent by variation in the rate of absorption, the above evidence seems to show that the blood-sugar has a relation to the blood-fat, other than that of a mere oxidising agent. Fat properly absorbed into the tissues appears to increase the storage of carbohydrate; if not so absorbed, or if mobilised by calcium, the storage is interfered with. Possibly improper storage of the fat may account for the tendency of a high fat diet to produce glycosuria in some cases of diabetes.

It is noticeable that practically all conditions which lead to a hyperglycæmia lead to a lipæmia as well; this may be attributed to diminished oxidation. We have been able to produce a distinct rise of blood-fat in addition to a hyperglycæmia by the injection of adrenalin (from 0·48 to 0·56 per cent.); in this case, at least, it is difficult to understand why the liberation of a large amount of oxidising material should be accompanied by an increase of the substance to be oxidised. We suggest that a more probable explanation is that both were stored and liberated together, an explanation which recent work on the effect of insulin in diminishing lipæmia does much to confirm.[6]

In conclusion, we wish to express our thanks to Prof. Shaw Dunn for allowing these experiments to be conducted in his laboratory.

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A SERIES OF CASES OF TUBERCULOSIS TREATED WITH SPAHLINGER'S VACCINE.

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DURING the period 1913–14, the following cases were treated at Victoria Park, by means of the Spahlinger vaccine. (Cases 10 and 11 were treated with serum.) In each case the nature of the treatment was explained as far as possible to the patient or his relatives, and permission to use it obtained. One of us (E. H. C.) was responsible for the treatment, and the other (S. R. G.) for the laboratory examinations involved, whilst Mr. Spahlinger himself prepared the vaccines in his own laboratory. As far as we can ascertain, the following list comprises all the cases treated, with the exception of one, some sheets of whose record have been unfortunately mislaid. It was not a fatal case. On leaving Victoria Park, some of these patients had a further course of vaccine at Mr. Spahlinger's laboratory in London until October, 1914, but the records here given deal only with the period of their treatment in Victoria Park Hospital.

CASE 1.—J. W. A., aged 35, light meter maker. *Family history of tuberculosis.* History of cough for *last two winters*, hæmoptysis two months ago. *On admission*, 21/8/1913, there were signs of infiltration at *right apex* and left upper lobe; mild pyrexia, *small amount* of sputum, tubercle bacilli present; weight, 8 st. 10½ lb. Thirty-two injections given. On discharge, 17/1/1914, there were no active physical *signs*, temperature was normal, the last three *sputum examinations* were negative, and the weight 9 st. 3½ lb. In 1923 reported as well and at work since 1915.

CASE 2.—J. H. C., male, aged 30, furniture remover's porter. History of cough, hæmoptysis six years ago and again recently, and of loss of weight (1 st.); in-patient Brompton Hospital, 1909, later Mount Vernon, and South Mimms. On admission, 29/11/1913, signs of some re-activity of old lesions, but afebrile; weight, 10 st. 13½ lb. There was a small amount of sputum, tubercle bacilli found once in 19 examinations. Twenty-three injections given. On discharge, 9/4/1914, there were no signs of active disease, and weight was 11 st. ¼ lb. In 1923 reported as well and at work since 1915.

CASE 3.—C. D., male, aged 34, cook. Pulmonary tuberculosis first diagnosed in 1911; had lost 9 lb. in weight. *On admission, 4/8/1914, there were signs of infiltration of* right upper lobe and left apex, mild pyrexia; weight, 9 st. 10¼ lb. Sputum was scanty and contained tubercle bacilli. Had had *injections* of Spahlinger vaccine before admission. Five injections given at Victoria Park. On discharge, 3/10/1914, there were no signs of active disease, temperature was normal, sputum absent, and weight 10 st. 1 lb. In 1923 reported as well and as having been in active work since 1915.

CASE 4.—G. W. J. F., male, aged 37, general labourer. Father and one sister had died of tuberculosis. Had lost 23 lb. in weight. Had previously been an in-patient at Victoria Park in 1912, when he had 29 sputum examinations, only one of which was positive; transferred to sanatorium in 1913. On admission again, 27/5/1914, signs were chiefly bronchitic, with some infiltration of both lungs; there was mild pyrexia with scanty sputum, 17 examinations for tubercle bacilli being negative; weight, 9 st. 6½ lb.; dyspnœa on exertion, pain in chest, palpitation, giddiness, indigestion. Fifteen injections given. On discharge, 14/10/1914, there was no evidence of active disease beyond a few scattered rhonchi; temperature normal; weight, 9 st. 13¼ lb. Enlisted in army during war. At present time attending out-patient department as a pensioner; three examinations of sputum for tubercle bacilli have been negative. Reported as at work since war service.

CASE 5.—F. M. J., female, aged 34, post-office clerk. Father died of pulmonary tuberculosis. History of cough, general weakness, dyspnœa, night-sweats, loss of weight (1 st.). Hæmoptysis three months ago. On admission, 24/10/1913, she had tachycardia, pains in back, indigestion, and signs of infiltration of both upper apices and left base; no fever; a trace of sputum on one occasion only, when it contained no tubercle bacilli; weight, 6 st. 8 lb. Fourteen injections given. On discharge, 17/1/1914, moist sounds had cleared up and weight was 6 st. 8¾ lb. In 1923 *reported* as well and at work since 1914.

CASE 6.—J. E. P., female, aged 39, married. Father died of pulmonary tuberculosis. History of cough, dyspnœa, night-sweats, general weakness, and loss of weight (1 st.), six months' duration; hæmoptysis three months ago. On admission, 24/10/1913, she had pain in back, indigestion, tachycardia, and slight pyrexia, with signs of early infiltration of both apices and left base; a trace of sputum obtained on two occasions only, no tubercle bacilli present; weight, 7 st. 13 lb. Eleven injections were given. On discharge, 20/12/1913, there were no active signs in lungs and no pyrexia; weight, 8 st. 5 lb. In 1923 reported as well and at work since 1914.

CASE 7.—A. W., male, aged 49, hairdresser. History of cough for last seven years, with hæmoptysis three years ago, and recent loss of weight (10 lb.). Pulmonary tuberculosis first diagnosed in 1911, when he had treatment in a sanatorium. On admission, 22/9/1913, there were signs of infiltration of whole of right lung with excavation and disease of left upper lobe; laryngitis; afebrile; half an ounce of sputum daily, tubercle bacilli present; weight, 9 st. 6 lb. Thirty-two injections given. On discharge, 10/2/1914, chest almost dry, sputum very scanty, bacilli present on last examination a week before discharge; afebrile; weight, 9 st. 8 lb. In 1923 reported as well and at work since 1914.

CASE 8.—J. C. N., aged 40, chauffeur. History of cough, two to three months' duration, with loss of weight (6 lb.) and a streak of blood in sputum a fortnight before admission. Admitted 19/9/1913, with signs of infiltration of upper lobe, half an ounce of sputum daily, tubercle bacilli present; afebrile; weight, 9 st. 2 lb. Twenty-three injections given. On discharge, 15/1/1914, no moist sounds were found in lung, and last four sputum examinations showed no tubercle bacilli; afebrile; weight, 8 st. 11 lb.

CASE 9.—W. T., male, aged 37, engineer's labourer. History of chronic cough for some years, with loss of weight (9 lb.), tubercle bacilli reported to have been found in sputum by panel doctor and also whilst at sanatorium. On admission, 18/10/1913, there were signs at both apices and left base behind, but sputum was scanty, and no tubercle bacilli were present; afebrile; weight, 10 st. 5¾ lb. Fifteen injections given. On discharge, 14/1/1914, there were no signs of activity, still a trace of sputum, but nine examinations for bacilli had been negative; afebrile; weight, 10 st. 8½ lb. Reported as killed in France during the war.

CASE 10.—A. E. F., male, aged 37, brass-plate maker. History of cough, &c., 10 weeks' duration, and loss of weight (15 lb.). On admission, 20/10/1913, he had dyspnœa, general weakness, pain in chest, indigestion, and signs all over left side (? pleuritic) and at right upper lobe, with a trace of sputum but no tubercle bacilli; febrile; weight, 8 st. 2 lb. Eight injections (serum) given. On discharge, 28/2/1914, no moist sounds were heard in lung and 15 sputum examinations had been negative; afebrile; weight, 8 st. 12½ lb.

CASE 11.—F. E., female, aged 14. Father and mother died of tuberculosis. History of enlarged glands of neck since three years of age. On admission, 31/10/1913, there were enlarged hard glands on left side of neck, one of them showing signs of breaking down; no signs in lungs, and the trace of sputum obtained on four occasions showed no bacilli; afebrile; weight, 5 st. 2 lb. Eleven injections (serum) given, followed by three more after an interval of rest. On discharge, 1/4/1914, glands had subsided and weight increased to 5 st. 11 lb.

CASE 12.—J. P., male, aged 18, hairdresser. History of cough, &c., two years' duration. On admission, 27/1/1914, there were signs of infiltration of whole of right lung and left apex; sputum scanty, bacilli present; afebrile; weight, 8 st. 13¼ lb. Twenty injections given. On discharge, 20/7/1914, there were still moist sounds in right lung with scanty sputum, and bacilli present; afebrile; weight, 9 st. 8½ lb. Readmitted with stained sputum and tubercle bacilli present, 3/4/1917, but discharged at own request a fortnight later and joined the army. Readmitted again in 1922 and died. Autopsy refused by relatives.

CASE 13.—H. P., male, aged 25, railway clerk. History of cough eight months' duration. On admission, 11/8/1914, there were signs of infiltration of both apices with scanty sputum, tubercle bacilli present; febrile; weight, 9 st. 10 lb. Only four injections given; Spahlinger's vaccine treatment then stopped, owing to outbreak of war. On discharge, 7/6/1915, no moist sounds were heard, tubercle bacilli were still present; afebrile; weight, 10 st. 3¾ lb.; transferred to sanatorium.

CASE 14.—E. F., male, aged 34, schoolmaster. Two brothers died of pulmonary tuberculosis. History of cough, &c., two and a half years' duration, loss of weight, and hæmoptysis. On admission, 25/5/1914, there were signs of infiltration of right upper lobe and left apex; sputum scanty, bacilli present; weight, 12 st. 10 lb. Sixteen injections given. On discharge, 17/9/1914, the lungs were practically dry, sputum scanty, bacilli present; weight, 12 st. 12 lb. Patient reported himself as well and at work in 1916 and again in 1917. In 1923 reported as not traced.

CASE 15.—J. H., male, aged 32, joiner. An advanced case who came over from Paris specially to try the treatment. Three years' history. On admission, 19/5/1914, there were extensive signs in both lungs, with three to four ounces of sputum daily and tubercle bacilli present in large numbers; irregular pyrexia; weight, 8 st. 4¼ lb. As no Spahlinger serum was then available and patient was considered too advanced for vaccine treatment, eight injections of lipoids (lecithin, &c.) prepared by Mr. Spahlinger, were given. Patient got steadily worse, and died 16/7/1914. Autopsy could not be obtained.

CASE 16.—C. N., male, aged 22, student. History of pleurisy a year ago. On admission, 15/7/1914, there were signs of fibrosis of whole of left lung and recent infiltration of right apex; sputum scanty, bacilli present; febrile; weight, 10 st. 6¾ lb. Nine injections given, and Spahlinger treatment then stopped owing to outbreak of war. Subsequently an autogenous streptoccocal (from sputum) vaccine given. On discharge, 9/2/1915, signs in lungs had not markedly altered, but sputum contained no tubercle bacilli; still febrile; weight, 10 st. 6 lb.

CASE 17.—A. W. T., male, aged 34, groom. History of cough, hæmoptysis, &c., for the last ten weeks. On admission, 1/12/1913, there were signs of infiltration of right upper lobe, with excavations at apex and infiltration at *left hilus*; slight pyrexia; *sputum* scanty, tubercle bacilli present; weight, 9 st. 9 lb. On discharge, 30/6/1914, no moist sounds were heard; afebrile. In 1920 reported as well and at work, and in 1923 as not traced.

In fairness to Mr. Spahlinger we would point out that the cases were treated during the early stages of his research, and that the work was interrupted by the war. We have refrained from making any comments on the cases.

ACUTE *BACILLUS COLI* INFECTION OF THE GASTRO-INTESTINAL TRACT

IN A NEW-BORN BABY, CONTRACTED FROM ITS MOTHER.

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THERE are very few records of fully investigated cases of acute gastro-intestinal infection in the new-born contracted from the mother at birth detailed in the literature. Julius Hess[1] states that streptococcal infection of the infant may occur through the maternal circulation, or secondarily through the mother's milk, lochia, or other infected material reaching the gastro-intestinal tract of the baby. Infections of the intestinal tract due to dysentery, typhoid, and paratyphoid bacilli are seldom seen during the first few days of life unless the mother is infected, but colon infections are not so uncommon. Nauwerk and Flinzer[2] quoted by Ritter von Reuss, refer to the case of a child who died on the second day after birth from melæna. *B. paratyphosus* B was isolated and was agglutinated by the mother's blood. The mother, a few weeks before delivery, had suffered from severe diarrhœa. These authors also suggest that during birth infection of the child may occur from bacteria present in the mother's vagina, or that infected lochia may be swallowed by the child and cause an infection of the intestinal tract.

As we possess the full records of the illness of a child from birth up to and including the period of convalescence, we have considered it advisable to place our observations on record so that this method of infection of the child may be fully considered in the future. The mother in this case had suffered from an infection of the urinary tract due to a colon bacillus which had caused acute symptoms with high temperature and the usual associated clinical phenomena on two occasions during the antenatal period.

It may be advantageous here to refer briefly to the work of Dudgeon, Wordley, and Bawtree[3] on *B. coli* infections of the urinary tract. They have divided these infections into hæmolytic and non-hæmolytic, and further subdivided the two groups with agglutinating antisera. They have shown further that in colon infections of the urinary tract it may be possible to isolate the causative organism from the intestinal tract. In their experience, the most severe urinary infections are caused more commonly by hæmolytic strains, and the infections caused by hæmolytic colon bacilli are more common in the male sex. The commonest hæmolytic strain in coli infections of the urinary tract is that labelled by them as "Dow," and this is the responsible organism in the case about to be described in detail.

Clinical History.—Female child; full term; labour normal. Birth weight 8 lb. Breast-fed from birth, at four-hourly intervals; five feeds. The third day after birth the baby became very restless and began to vomit. The vomiting occurred during feeds and in the intervals, on the average three to four times daily. Test weighing showed that it received 21 oz. of milk on the fifth day. From the sixth day it was fed on expressed breast milk diluted one-third, so that the total amount of milk allowed was 15 oz Normal meconium was passed at the outset, but on the fifth day mucus began to be present in the stools. The child was first seen by one of us (R. C. J.) on the ninth day; she was then very restless, the limbs were rigid, colour was greyish. She was passing thick tenacious mucus, vomiting mucus, and had three septic fingers. Temp. 99° F. Weight, 7 lb. 3 oz.

Treatment.—Treatment was commenced by giving 1 drachm each of castor and olive oils. She was fed on expressed breast milk, boiled for four minutes and diluted one-fourth with water. On the twelfth day the condition was worse; the greyish colour was more marked; vomiting was more frequent and much more mucus was passed per rectum; the weight had fallen to 7 lb. Rectal irrigation was ordered with a solution of bicarbonate of soda followed by normal saline. During the next few days the amount of mucus passed in the stools was excessive; restlessness was very pronounced; there was evidence of severe abdominal discomfort, and the fingers were still septic. Rectal lavage caused the evacuation of considerable quantities of mucus, together with milk curds. The temperature varied from 97°–99°. Some septic spots now appeared on the back. Castor oil was given at repeated intervals, and syrup of dimol, 15 minims, three times daily. The weight fell to 6 lb. 14 oz. on the seventeenth day.

Course of Condition.—On the twenty-fifth day feeding with breast milk had to be discontinued owing to the mother's condition, as in addition to a colon infection she was suffering from organic heart disease. The child was then fed on a modified unsweetened condensed milk mixture giving percentages of sugar 5·7, fat 1·4, protein 1·4. The caloric value of the food was 216 against a theoretical caloric requirement of 350. The sugar (dextri-maltose) was gradually raised to 7 per cent., but the fat was kept low owing to a marked inability to digest fat. By the thirty-fifth day the child was taking sufficient food to yield its theoretical caloric requirement—i.e., 350 cals. Mucus continued to be passed at intervals but became much less; the septic lesions healed and the colour improved. Orange juice was later introduced into the diet. Small vomits continued after feeds, and in some of these mucus was present. The weight showed a steady increase. From the thirty-second day the diet was gradually changed to a fresh cows' milk mixture, giving percentages of sugar 6·9, fat 2·7, protein 1·5. It was not until the sixty-ninth day after birth that the mucus had disappeared from the stools on naked-eye examination, and these now became normal for the first time. After this time the vomits were less frequent, but they still contained small quantities of mucus at intervals. The cows' milk mixture was continued, but it was still found necessary to keep the fat down to 2·7 per cent. (a 50 per cent. crude cod-liver oil emulsion was used to adjust the fat).

The child now (18 weeks) appears to be in better health; the stools are normal, but there are still occasional vomits with mucus, and the last sample of mucus examined (at 16 weeks) showed the presence of the same strain of *Bacillus coli* in abundance. The temperature varies between 98° and 99°. The urine (at 18 weeks) contained bacilli, but no pus, and the bacillus proved to be the same strain of *Bacillus coli* as found elsewhere.

Bacteriological Examination of Mother.

Urine.—Very turbid; pus, masses of Gram-negative bacilli, and traces of sugar present. A pure culture was obtained of an actively hæmolytic colon bacillus.

Lochia.—Leucocytes abundant and Gram-negative bacilli; pure culture obtained of an actively hæmolytic colon bacillus. Breast milk: First examination made 11 days after the birth of the child; some polymorphs present, but no bacteria seen; epithelial cells numerous, both those containing fat droplets and fat-free cells. Free fat and degenerated cells abundant. A considerable growth was obtained of a non-hæmolytic Gram-positive short-chained strepto-diplococcus, which formed acid in mannite, lactose, and salicin, firmly clotted milk, but inulin was unaffected. The milk was re-examined a week later; streptococci were present but relatively scarce, but the *Staphylococcus albus* was abundant. Colon bacilli were not cultivated on either occasion.

Blood.—Examination made 18 days after the confinement. Red cells, 4,260,000 c.mm.; hæmoglobin, 72 per cent.; colour index, 0·8; leucocytes, 6720 per c.mm.; polymorphs, 71 per cent.; eosins. 6 per cent.

Blood Serum.—The blood serum gave an end-point agglutination with the typhoid antigen of 1 in 100, 1 in 25 with paratyphoid A, but no reaction with B or C (inoculation).

Bacillus Coli Reactions.—Several strains were employed as antigens, but the only positive reaction occurred with the standard hæmolytic urinary antigen "Dow" which is similar to the organism infecting both mother and child. A complete reaction occurred with a dilution of 1 in 100. incomplete 1 in 400, and the end-point of the reaction was 1 in 1000. The serum was also tested for the precipitin reaction with the same strain of colon bacillus. The filtered antigen employed by Dudgeon, Wordley, and Bawtree[3] was used. A positive reaction occurred with dilutions of 1 in 5, 10, 20, 40, and 80.

Bacteriological Examination of Infant.

Fæces.—Mucus present in great abundance; well-marked bile reaction obtained; blood present and masses of both leucocytes and epithelial cells. Fats and soaps also present.

A very heavy growth was obtained of the hæmolytic bacillus coli, and of a non-hæmolytic streptococcus. These were the only bacteria present on blood-agar plates after the motion had been dried on tiles as introduced by Dudgeon for the routine bacteriological examination of the fæces.[3] [4] The streptococcus present in the fæces of the baby was morphologically and culturally similar to the streptococcus which had grown so abundantly in the mother's milk, and in both instances was non-hæmolytic. The *B. coli*, which was actively hæmolytic in solid and liquid media, was similar in every detail with the strains isolated from the mother. A second examination of the baby's fæces was made 14 days later. They were now semi-solid, and only traces of mucus were present. Hæmolytic colon bacilli were present, but relatively scanty as compared with the previous records. Numerous colonies of hæmolytic *Staphylococcus aureus* and *albus* were obtained and of non-hæmolytic streptococci. The urine was normal, but during convalescence the infant developed a bacilluria, due to the same strain of colon bacillus.

Vomit.—The thick mucus vomited by the baby was examined. Bacilli were found to be numerous, and an abundant growth of hæmolytic colon bacilli and non-hæmolytic streptococci were obtained. On re-examination one week later colon bacilli were not cultivated, but were isolated at a later period.

Colon Bacilli.—The same strain of colon bacilli was isolated from the urine and lochia of the mother, and from the intestinal mucus, gastric contents, and urine of the infant. The colonies formed abundance of acid and gas in lactose and mannitol, rapidly clotted milk, gave a marked indol reaction, and did not liquefy gelatin. Saccharose was rendered alkaline, while acid and gas was formed in dulcitol, but this medium subsequently became alkaline. These colon strains were very actively hæmolytic on blood-agar, and in 0·5 per cent. and 0·85 per cent. sodium chloride in peptone water to which 0·1 c.cm. of human red cells was added. The hæmolytic action was of equal intensity in both the stages detailed by Dudgeon, Wordley, and Bawtree.[3]

Serological Results.—The bacilli isolated from the various sources referred to were subcultured on ten successive occasions in veal broth and tested with the various colon anti-sera derived from hæmolytic and non-hæmolytic strains referred to by the above-mentioned investigators. The anti-serum made from the commonest hæmolytic colon strain known as "Dow" reacted to full titre with these cultures. The end-point of 1 in 20,000 was reached, which is the limit of reaction between the anti-serum and its own antigen. It was also shown that the blood of the mother reacted with this antigen to the extent of $\frac{1000}{20000}$, which is a very strong colon agglutination reaction for a human serum.

Harvey Cushing and Livingood[5] published a most interesting and valuable contribution to the bacteriology of the alimentary canal in the Johns Hopkins Hospital Reports in 1900. The intestinal flora are grouped into the obligatory or permanent intestinal bacteria, and the transient which are introduced with the food and persist only when a suitable pathological process is present in the intestinal mucosa or when they are the cause of such a condition. Cushing and Livingood refer to the original work on human sucklings by Escherich in 1885 and 1886, where he showed that *B. lactis aerogenes* is the obligatory form which is present high up in the digestive tract, while *B. coli* flourishes lower down. The essential fact, however, that these bacteria which are not present in the meconium at birth must enter with the food, swallowed air, or during bathing of the infant, is discussed. In our case the colon bacillus was present in pure culture in the stomach mucus, as well as in that passed per rectum, and the organism known as the *B. lactis aerogenes* was not isolated. Todd[4] examined 101 specimens of normal fæces from 91 healthy children under 1 year of age. The stools were examined bacteriologically by Dudgeon's method referred to in detail by Todd and Wordley.[6] Hæmolytic colon bacilli were obtained in 12 cases, and in eight of the number the ages of the babies, which were breast-fed, varied from 2 to 19 days. It is important, however, to contrast the findings in our case, in which the colon bacilli cultivated at the commencement of the illness were all hæmolytic and were present in great abundance, with the findings in Todd's cases, where hæmolytic colonies were present, but only in limited numbers. Of the eight strains isolated by him, six were agglutinated by the colon anti-serum (hæmolytic type "Dow") which is the same anti-serum as we employed.

Discussion.

At the present time, while world-wide attention is devoted to the subject of infant welfare and the causes of infant mortality, it is of the utmost importance to realise that various infective conditions may occur at the ante- and post-natal periods and at the short interval during the birth of the child. It is to this intermediate or intra-natal stage that this case which we have described in detail belongs. In this instance the mother was infected with a certain strain of *B. coli* which had produced two attacks of acute coli fever. The urine contained a large amount of pus and masses of bacilli, and the lochia also were similarly infected. In our opinion, the baby was infected at birth by swallowing the urine or lochia in which the organism was present in abundance. There is very little information to be obtained from the literature of this method of infection, although some continental and American writers refer to it. The possibility of the child being infected during the ante-natal period with this organism must also be considered, as it is known to occur in typhoid and paratyphoid fevers from infection in the mother. Our view that the infection occurred at birth is supported by the fact that the illness commenced about three days after birth, and the condition of the child at birth was perfectly satisfactory. The illness commenced and continued with gastro-intestinal symptoms and associated clinical phenomena. The child passed thick mucus by the bowel for some weeks and also vomited mucus. The causative organism was present in the intestinal mucus for many weeks, and 18 weeks from the onset of the illness it was present in the vomited material during a gastro-intestinal upset. At this period the urine was found to show a bacilluria due to the same organism. The illness was so severe that it nearly cost the life of the child, and improvement only occurred after many weeks of most careful nursing and treatment. It was thought that the mother's milk might also be infected with the colon bacillus, partly because of the general infection from which she had suffered, but also owing to information obtained by us from our investigations on the bacteriology of human milk which are now in progress. Repeated examination, however, failed to confirm this suspicion. It is possible from the available evidence that the heavy streptococcal infection of the mother's milk may have assisted in the causation of the gastro-intestinal infection in the infant.

In the case of breast-fed infants, a gastro-enteritis is very frequently caused by over-feeding, but when the amount of breast milk is proved by test weighing to be *not* in excess, and the enteritis continues with loss of weight, the case we have reported indicates the necessity for: (1) A bacteriological investigation of the breast milk, as well as a chemical examination; (2) a bacteriological examination of the stools and vomit of the child.

Further, when dealing with women known to have a coli infection, it would appear wise to take special care to cleanse the mouth of the child as soon as possible after birth with some non-irritant antiseptic solution, in a similar manner to which the eyes are treated with silver nitrate solution when a gonococcal infection in the mother is present.

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A CASE OF
QUINTUPLE PREGNANCY.

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IN 1904 Prof. Nijhoff[1] of Groningen (Netherlands) published the notes of a case of quintuplets which occurred in the practice of his friend, Dr. De Blécourt. With De Blécourt[2] he collected from the obstetrical literature, from 1694 to 1900, 28 additional cases. These they published the same year in book form. Further cases were recorded by Bernheim[3] in 1904, Martin[4] in 1917, and Hehir[5] in 1922. We have not been able to procure a copy of De Blécourt's and Nijhoff's monograph, but in the four cases above quoted the children were all well formed, although immature, and in three cases at least they died in a few hours or days. In the case reported by Sir P. Hehir, the children were stated to be of quite large size and doing well the day following birth. To date, therefore, it appears that 32 cases of quintuple pregnancy have been recorded.

The case which we now report differs from those already quoted in that two of the five fœtuses were monsters. One was anencephalic, and the other a small monstrous embryo only 3 cm. long.

History.—The patient, a multipara aged 33, had been married 11 years, and pregnant four times. Her first pregnancy terminated in a full-term normal labour ten years ago, and the child is still alive and healthy. Five years later she had a second uneventful normal labour, child alive and well. On May 19th, 1921, she aborted a two months fœtus and the uterus was curetted. Following the curette, she developed an abscess in the uterine wall, which subsequently burst into the peritoneal cavity. The patient had a perilous time, but was able to leave hospital in five weeks.

Her fourth pregnancy is the one under consideration. Her last menstruation ceased on May 26th, 1922. She was first seen at the beginning of October (by S. R. F.), wasted, anæmic, and slightly jaundiced. The uterus reached to just below the umbilicus. No fœtal parts could be felt, the patient said she had not felt movements, and no fœtal heart could be heard. Other signs of pregnancy were present, however, and on bi-manual examination the abdominal tumour was undoubtedly the uterus. It was felt certain, therefore, that the patient had within her uterus a product of conception.

Admission to Hospital.—Although the vomiting ceased the patient continued to lose flesh and appetite. She was admitted into hospital on Nov. 2nd, 1922. The uterus had now reached to three fingers-breadth above the umbilicus, but still no fœtal parts could be felt and no fœtal heart heard. The patient was very thin and slightly jaundiced. An examination of the urine proved negative. It was decided to empty the uterus. The cervix was dilated up to No. 12 Hegar, and a small rubber hydrostatic balloon was inserted into the lower uterine segment. After remaining in for 24 hours without labour resulting, it was removed and on the 5th the lower uterine segment was plugged with gauze.

Delivery.—During the night the patient had labour pains, but they were weak, occurred only at long intervals, and finally ceased altogether at 6 A.M. Mr. Thomas Holmes examined the case, and at 11 A.M. on the 6th the patient was anæsthetised. After removal of the gauze the os was found to be almost completely dilated and a bag of membranes presenting. The membranes were ruptured, a pair of feet brought down, and a small fœtus extracted. Another bag of membranes presented and was ruptured, and another fœtus extracted by the breech. Two others followed in exactly the same way. Rather sharp hæmorrhage now occurred, and the placenta was removed manually. It was very adherent and unfortunately damaged a good deal in its removal. Attached to the placental mass by a long thin cord a small smooth body was noticed and preserved; it proved to be a monstrous embryo. The four children were all immature, alive when born, but all died within half an hour. All were females, three were perfectly formed, one was an anencephalic monster. Their lengths and weights are as follows: (1) 29 cm., 15¼ oz.; (2) 30 cm., 15½ oz.; (3) 28 cm., 13¾ oz.; (4) 23 cm., 9¾ oz. (anencephalic).

The fifth fœtus was entrusted to Dr. Thomas Walmsley, professor of anatomy in the University of Belfast, who stained and sectioned it, and reported it as being a small monstrous mass measuring 3 cm. in length. "Attached to about the centre part of its anterior surface there was a delicate umbilical cord which contained, as demonstrated on microscopic section, small thin walled blood-vessels. The embryonic mass itself, on section, was found to consist of a surface covering of well-differentiated ectoderm, in which skin glands were definitely formed. Within the ectoderm the tissue mass was of the undifferentiated round cell type, a small amount of pre-cartilaginous tissue in the head region being the only definitive formation which could be recognised. There is no doubt, of course, of the embryonic nature of the rudiment."

The placenta weighed 15¾ oz. It was much damaged, but four separate amniotic sacs could be pieced together. The chorion could not be traced with any certainty. Five umbilical cords were attached to the placenta. Four were of ordinary size and corresponded to the formed fœtuses; the fifth, attached to the small monster, was only 1 mm. in diameter and 4½ in. long.

The patient had a normal puerperium, and left hospital in 14 days much improved. Two months later she had regained her lost weight and was looking and feeling quite well. With regard to the family history, a sister of the patient has had one pair of twins, and the wife of a brother has also had twins once. Otherwise the family history is negative.

Our thanks are due to Prof. Walmsley for the preparation of the sections, to the librarian of the Royal Society of Medicine for the loan of papers, and to Mr. T. Holmes for permission to publish the case.

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Medical Societies.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

THE eighty-second annual meeting of the Association was held at the rooms of the Medical Society of London and the Royal Society of Medicine from July 9th to 13th, under the presidency of Lieut.-Colonel E. GOODALL (Cardiff Mental Hospital).

Sir Fredk. Willis, Sir Arthur Rose, and Dr. Havelock Ellis were unanimously elected honorary members of the Association. Dr. J. Carswell was appointed Maudsley Lecturer for 1924.

Dr. J. G. PORTER PHILLIPS (resident physician, Bethlem Hospital) read a paper on

Early Treatment of Mental Disorder,

really a survey of the out-patient practice of that institution. He said that in its early stage mental disorder might often permit the individual to adjust himself to his surroundings and follow his avocation without ever deserving the label "insanity." The exacting nature of life was chiefly felt by those with a weak or unstable mental make-up. Latterly several specialised clinics had sprung up to deal with early treatment of mental disorder. The out-patient department at Bethlem Hospital was inaugurated in 1919, and in 1922 the Maudsley Hospital commenced the indoor and outdoor treatment of civilians. The most hopeful results were to be looked for in cases in which mental and physical collapse was only partial and there was a good history. On the economic side of the question he pointed out that the cost per patient in out-patient treatment was about one-tenth that of a resident patient in a county mental hospital. Early treatment not only avoided much domestic misery and exhaustion of other members of the family; it also afforded good opportunities for research, whose results would greatly benefit mankind. At the Bethlem Hospital clinic 323 new cases were seen during the year. Dr. Phillips emphasised the great importance of the social side of this work carried on by the almoner and inquiry officer, who made careful and tactful inquiries into the home life and general conditions of the patients. He reviewed the provisions of the new Mental Treatment Bill, which he regarded as a stride forward in State medicine, remarking that the secret of modern progress often lay in propaganda.

The Relation of Chronic Sepsis to Mental Disorders.

This was the title of a very exhaustive paper by Dr. Henry Cotton, lecturer in psycho-pathology at Princeton (U.S.A.) University. He first paid a tribute to the part played by Dr. William Hunter in 1900, in drawing attention to the rôle of chronic sepsis in medicine; also to the work of Dr. Chalmers Watson.[1] In 1905 Dr. Cotton, working under Alzheimer at the psychiatric clinic in Munich, found distinct changes in the nerve cells in so-called functional disorders. Alzheimer regarded these changes as very significant. This shifted the conception of these disorders, which were previously considered to be primarily diseases of the mind and not of the brain. The former view was not logical, as abnormal structure seemed a necessary condition for abnormal functioning. He set himself to determine the cause of the associated fatty degeneration of the cortical nerve cells in the functional psychoses. A five years' study of disturbances of the endocrine system gave no decisive result, and gland therapy was a failure. In 1918, following the work of Hastings and King, they began to eradicate all foci of chronic sepsis from their patients, and the reward was an increase in the recovery-rate from 37 per cent. to 85 per cent. in the first year. Attention to the genito-urinary system was an important part of this work, and in some enucleation of the vesicles was necessary. It was not claimed that this work had solved the problem of mental disorders, but it had shown that disease of the brain tissue was the fundamental condition. The success of this work was based on the utilisation of all the methods developed in the field of general medicine, and especially that of chronic sepsis. Heredity, he thought, should not occupy the important place it had been assigned in the past: it was an idea which had been an obstacle to advance. He also thought that many of the extravagant claims made by psycho-analysts were unjustified, and Freudism had been a great handicap to psychiatry. He did not minimise the importance of the psychogenic factors in the causation of the psychoses, but regarded them as precipitative rather than causative, for in some cases psychosis developed without such factors being present. He proceeded to establish the thesis that chronic sepsis was a large and very important determining factor in mental disorders, and that these psychotic patients harboured multiple foci of infection. Hence he regarded the psychosis as a symptom—sometimes a terminal symptom—rather than as a disease entity. The paper contained a detailed reference to the foci found, and their micrococcal inhabitants. He was able to return 82 per cent. of the discharges as recoveries; and a successful treatment of 1412 cases in four years.

A discussion followed, in which Dr. W. Hunter, Dr. Chalmers Watson, Dr. T. C. Graves, and others took part.

Dr. Clement Lovell (pathologist at Bethlem Hospital) read a paper on the

Surface Tension of the Serum in Anxiety Psychoses.

He said no relation had been traced between the disappearance of blood-sugar and the alteration of the surface tension: but by dialysing heated and unheated specimens against distilled water he found a difference in the union of electrolyte and protein in the normal person and the anxiety case. In anxiety cases he found there was increased nucleation of the interlobular connective tissue of the pancreas. If the theory he advanced was true, a large number of the anxiety cases were due to a disordered endocrine balance, in which the pancreas was primarily at fault. Hence the treatment should be aimed at stimulating the pancreas, and vaccine methods directed to inflammatory conditions.

Dr. R. M. Stewart read a paper entitled

General Paralysis: Its Unsolved Problems.

Among the questions he propounded were the following: Was the *Spirochæta pallida* alone responsible for the genesis of general paralysis? When and how did it gain access to the nervous system? Was there a special strain of it in these cases? Or must the individual resistance of the infected person be considered as the deciding factor in the development of the disease? What was the meaning of the long latent interval before the onset of symptoms? Why did the cerebro-spinal fluid contain no organisms at a time when the brain contained millions? Why did not tabes, general paralysis, and optic atrophy occur in conjunction more frequently? Why did arsenical compounds fail to cure? He devoted his paper to a consideration of two problems: (1) the time of invasion of the nervous system in general paralysis; (2) the existence of special neurotropic strains of the *Spirochæta pallida*. General paralysis of the insane seldom occurred less than six to ten years after syphilitic infection; in tabes the period was usually longer. It seemed probable that the spirochætes circulating in the blood-stream gained access to the brain or its membranes during the time of general dissemination, and lay dormant until there occurred a favourable opportunity for their multiplication. This view was supported by the biochemical and other changes in the cerebro-spinal fluid. If the spinal fluid and the nervous system showed changes in from 30 to 40 per cent. of all cases of syphilis, why did general paralysis develop in only about 5 per cent. of infected persons? Two explanations could be offered: the organisms which attacked the nervous system might do so because they possessed a special neurotropic action; or the disease might make its appearance because the patient possessed a neuropathic disposition. These he considered in some detail, pointing out peculiar racial features in regard to the incidence of general paralysis of the insane. H. Noguchi had found that the incubation period of thicker forms of spirochæte was long and the lesions nodular, hard and sharply defined; with the thinner and more active types, large diffuse lesions were produced. It seemed that deficient early treatment of syphilis was a determining factor in the onset of general paralysis later in life.

Histological Examination of Pituitary Body.

Sir Frederick Mott and Dr. Ida M. D. Robertson contributed an instructive analysis of 110 cases in which the pituitary body of patients dying in asylums and hospitals was histologically examined, the work having been done by Dr. Robertson and verified by Sir Frederick Mott.

The summary of the conclusions was as follows: The cases of tuberculosis showed a certain amount of exhaustion, as evidenced by the breaking up of the cytoplasm of the eosinophil cells, the increase of the chromophobes, and the increased number of nuclei. The intracellular lipoid was also decreased. In general paralysis the lipoid content, in both cells and interstitial tissue, was increased. Cases of dementia præcox showed a marked degree of exhaustion, to almost complete atrophy of the cellular elements of the gland. The distinguishing feature of this, as compared with tuberculosis, was a deficiency of the nuclear chromatin. The association of tuberculosis with dementia præcox, especially with the advanced stages, was very marked, but in one of the most definite cases tuberculosis was not present. With regard to other psychoses, there was, normally, a considerable similarity in structure and staining reactions of the eosinophil cells of the pituitary gland to the interstitial cells of the testes.

Dr. T. Beaton (Bethlem Hospital) contributed an elaborate paper on the

Psychogenic Factor in the Causation of Mental Disorder.

He said that there were two main views of insanity according to whether the causal factors accepted were psychogenic or physiogenic. The issue between these had been unnecessarily complicated by the persistence of the old argument of body against mind. These must not be regarded as separate and opposed, but complemental. He agreed with McDougall that the dominating partner in the trinity of cognition, affection, and conation was conation; that was the thread of purpose throughout the life-history of the organism which bound the successive phases of experience together. He insisted that the psychological description of mental phenomena must have a correlation in nervous function.

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[1] THE LANCET, 1922, ii., 127, 231.

Basal Metabolism in Mental Disorders and the Influence on it of the Diathermic Current.

Dr. JAMES WALKER (Cardiff Mental Hospital) read a paper with this title, paying special attention to dementia præcox. Mental and nervous symptoms occurred, he said, as a result of disease of the thyroid gland, but medication with the extract of that gland should only be employed where thyroid hypofunction was considered to be either a causative or a contributory factor. Several cases of dementia præcox he had shown to exhibit vagotonia—i.e., a subnormal body temperature, a tendency to bradycardia, and respiratory arrhythmia. In one or two of these cases examined during remission he had found an improvement in the basal metabolism and a disappearance of the vagotonic symptoms, showing that the oxidation deficiency in the cells was not a permanent condition. Psychic excitement profoundly affected metabolism, and produced a temporary increase in the sugar content of the blood. The most reliable information was yielded by patients in the stupor class, though these need not necessarily be cases of dementia præcox. He did not think the lowered metabolism was due to a diminution of the thyroid principle or autocoid, but to a decrease in all the bodily functions. With regard to treatment, the heat produced by the high-frequency current was endogenous—i.e., produced in the deeper-lying tissues. It produced a slight fall in the systolic blood pressure, an increase in the leucocytes, in the urine, and in the output of urea and ammonia nitrogen. The current produced, in 20 observed cases of mental disorder, an increase of 10 to 15 per cent. in the basal metabolism, 2 to 3 degrees increase in body temperature, and 20 to 30 beats per minute increase in the pulse. His conclusion was that diathermy was a useful therapeutic measure and one likely to play a definite part in furthering recovery. During remission in dementia præcox the basal metabolism approached that of the normal person.

Diagnosis of Dysenteric Infections in Mental Hospitals.

This subject was dealt with in an able paper by Dr. A. A. W. PETRIE, of the Maudsley Hospital. He said the diagnosis of acute cases was comparatively easy; the difficulty lay in the recognition of very mild chronic and latent cases. He first alluded to the causes of non-dysenteric diarrhœa, including tuberculous and nervous mucous colitis, and ulcerative colitis. With regard to the true dysenteries, the tropical dysentery due to the *Balantidium coli* could be excluded as it practically never occurred in mental hospitals. An investigation of asylum subjects showed 9·7 per cent. to be infected with the *Entamœba histolytica*, compared with 4 per cent. to 8 per cent. in the general population. He entered minutely into the differential characters, remarking that the principal bacilli occurring in bacillary dysentery were the Shiga bacillus and the Flexner bacillus, the former usually causing the more severe types of the disease, but the Flexner being the more common organism in asylum dysentery. In the chronic disease, help could be obtained from the agglutinins occurring in the blood.

The Ranchi European Mental Hospital, India.

The PRESIDENT read to the meeting a paper descriptive of the Ranchi Mental Hospital, contributed by Major OWEN BERKELEY-HILL, its medical officer-in-charge. This is the only mental hospital in India intended solely for the treatment of persons of either European or American parentage. The hospital is built on the "pavilion" system, and covers 85 acres, with ten wards, which will accommodate 92 male and 88 female patients. There is a nurse to every two or three patients and the general health is very good. The methods of life and treatment are detailed in the paper in a very interesting fashion.

In addition to other excursions, members visited the Maudsley Hospital, where Dr. EDWARD MAPOTHER explained the work being done there and gave some demonstrations in the laboratory.

ANNUAL DINNER OF THE MEDICO-PSYCHOLOGICAL ASSOCIATION.—The annual dinner was held at the Hotel Metropole, London, on July 11th, Dr. Edwin Goodall presiding. Dr. Percy Smith, who proposed "The Legislature," gave an interesting sketch of the history of legal restraint in relation to the safety of person and property. The Bill now before Parliament for the admission of patients to county and borough mental hospitals without the formality of certification had, he said, the bulk of professional opinion in its favour. He expressed the hope that its administration would not prove so harsh as to be another form of certification or so exacting as to be another dose of red tape. Lord Onslow, in replying, forecasted the passing of this Bill before the end of the year. The provisions it contained for after-care should often avoid the necessity for further institutional treatment, and facilities were also given for research in mental disease. Lord Riddell and Sir Sydney Russell-Wells also briefly replied. Dr. Goodall, proposing in humorous vein the "Sister Medical Societies," dwelt on the elevating influence of an association of medical men and women. There was, he said, something wrong with the medical fraternity of any community which had no medical society. Sir Humphry Rolleston, Mr. H. J. Waring, Sir William Hale-White, and Dr. Henry Cotton, of New Jersey, replied. Dr. C. Hubert Bond proposed "The Visitors," and Sir Eric Geddes "The Association." Sir Eric Geddes spoke with great sympathy of the vast field for research and investigation opening before mental medicine. Quite apart from hopeful lines of physical treatment, the aid of psychiatry seemed to him, as a layman, almost unexplored. If the case were put before the public clearly and definitely he believed the support obtained for the aims and objects of the Association would be overwhelming. In spite of the tropical heat the dinner was well attended and most successful.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

THE ninth annual conference of this Association was held in the University, Edmund-street, Birmingham, on July 12th, 13th, and 14th.

THURSDAY, JULY 12TH.

The conference was opened by the Right Hon. the Lord Mayor of Birmingham (Sir David Davis), who welcomed all members of the Association to the conference. Sir ARTHUR STANLEY presided over the meeting.

The LORD MAYOR in his opening speech referred to the work done in Birmingham in connexion with tuberculosis, and mentioned the fact that in this town, as in a large number of other towns, the campaign against tuberculosis had resulted in a very definite diminution in the number of new cases of the disease. For some three years before the war there was an average of 4000 new cases of pulmonary tuberculosis reported per annum; last year there were about 1700. The fall in the mortality had not been proportionately so great because it related to cases which commenced years ago, but at the same time there had been a decided drop, the rate for those three years being 0·9 per 1000 of the population. That was a reduction of 60 per cent. in mortality compared with the figure of 50 years ago. Fighting consumption was costing Birmingham nearly £90,000 per annum, but if the reduction in the prevalence of the disease be continued then the city was willing to spend the money.

The subject for the morning session was

Care of Advanced Cases of Tuberculosis, especially as regards Prevention of Infection.

A paper on this subject was read by Prof. J. Robertson (medical officer of health for Birmingham), prepared by the medical officer of health for Edinburgh (Dr. William Robertson), who was unable to be present. The opening paragraph of this paper was the cause of much discussion—namely: "It has yet to be realised by sanitary authorities that the segregation of the advanced case of pulmonary tuberculosis is quite as important as is the isolation of small-pox. From some points of view it is more so, because the spread of small-pox can be arrested in an effectual way by definite measures, while the spread of tuberculosis can only be controlled, as far as we know at present, by preventing the diffusion of the infecting micro-organisms." He further stated that there were far too many sufferers from pulmonary tuberculosis, not a few in an advanced stage of illness, wandering about our streets, resorting to places of public amusement, travelling in trains and trams, and freely scattering infection about them. He condemned home treatment when patients were living in overcrowded and insanitary homes totally unsuitable for the isolation of such a dangerous disease. The housing question, he says, is the Alpha of the tuberculosis problem, but when we discuss the advanced case of tuberculosis we reach the Omega of the subject. "A disease that can levy an annual toll of nearly 40,000 persons every year in our country provides an enemy that must be defeated by methods that are at our hands if we waste less time in discussion and get to business. We know that tuberculosis is preventable, and we have seen how better houses will prevent it." Dr. Robertson considered that warrants for the forcible removal to sanatorium of those who cannot with safety be looked after in their own homes. is a measure that will have to be enforced in the near future. "Surely," he added, "we can afford to be drastic when grappling with such a death-dealing malady." Enforced removal of advanced cases also caused much discussion.

In the succeeding discussion Dr. F. N. Kay Menzies (principal assistant medical officer of health, London County Council) stated that he considered the infectivity of tuberculosis had been greatly exaggerated, and this tended to have a detrimental effect on the work of professional men and to discourage voluntary effort. It also made it difficult for the great organisations in dealing with cases, because it carried with it a stigma on the patient which was hard on him in following his occupation in life. He did not agree that the segregation of tuberculosis was as important as that of small-pox. He further stated that 25 local authorities in this country, Birmingham being one of them, had been given the power compulsorily to remove highly infective cases of tuberculosis for so many months. He had asked these 25 authorities how many compulsory removals they had enforced, and the answer in nearly all instances was not more than one or two. The public would never put up with compulsory removal. He did not agree that housing was the Alpha of the tuberculosis problem. If one factor was to be concentrated upon, the most important was food.

Colonel S. Lyle Cummins (David Davies Professor of Tuberculosis, South Wales and Monmouth) said it would be ridiculous to compare the infectivity of tuberculosis with small-pox, and yet the infectivity of tuberculosis was a terribly real and dangerous thing, and it would not do to discard the importance of infection. He considered that the hope for the future lay in the discovery of a specific remedy, a prophylactic vaccine or both. A few months ago such a hope seemed remote. One variety of tuberculin after another had been tried, and the measure of success had not been very great. The last few weeks have opened up for us new vistas of investigation and effort; and once more, as so often in the past, the new light has come from laboratory research. It would be unwise, as yet, to claim that Prof. Dreyer's "antigen" is the long-sought remedy for which we have waited, but it can be stated with certainty that Dreyer has broken fresh ground and that the results already obtained were decidedly in advance of those of any previous worker, and that they are full of hope for the future.

Dr. W. H. Davison (assistant medical officer of health, Birmingham) considered compulsory removal a broken reed, and thought segregation in the home should be encouraged. It was the most humane method. There was a good scheme working in Birmingham at present whereby a patient can purchase a bed by the hire-system or have a bed lent to him free of charge. There were about 700 beds in use under this scheme, which was doing wonderful work in preventing the spread of infection. He considered it better to spend money on the proper methods of preventing the spread of the disease at home than on the cost of maintenance of an advanced case in an institution.

Dr. A. Fergus Hewat (assistant physician, Royal Infirmary, Edinburgh) considered early cases of tuberculosis might be as infective as the so-called advanced case with an old cavity. Patients who were bedridden and were living in small houses in contact with children he advocated should be removed, as also the cases who were disobedient in their preventive training.

Dr. Marcus Paterson (medical superintendent, Colindale Hospital, Hendon) did not agree with compulsory removal except in the case of the "rotter"—i.e., the man who was disobedient and who made no attempt to control infection. He mentioned the difficulty of removing the prejudice of the public against the sputum flask. He has proved this prejudice by travelling to Birmingham with a third-class ticket and a sputum flask instead of indulging in a first-class ticket in order to secure a comfortable journey. He stated that it had been necessary for him to spit into the flask 16 times, but it had enabled him to have a carriage to himself all the way. He thought the conference would do invaluable work if it helped to overcome this prejudice.

Dr. Ernest Watt (medical officer, Scottish Board of Health) gave some interesting statistical data showing the necessity for the removal of advanced infective cases.

Prof. Cawadias (of the University of Athens) told how the disease had been spread in villages in Greece by the return of emigrants. He considered segregation was the course to which reason prompted, but sentiment would not allow them to be too severe.

Prof. J. Robertson (medical officer of health for Birmingham) said that Dr. W. Robertson's statement that tuberculosis was spread as easily as small-pox he felt was not quite correct. He thought, however, that it was very nearly correct, as there was not much difference when they looked at the fact that very nearly the whole of the community was infected with tuberculosis at one time or another.

Dr. Bolton Thomson (Hastings), Dr. S. Barwise (M.O.H. for Derbyshire), Dr. G. C. Trotter (M.O.H. Islington), Dr. F. L. Moore (tuberculosis officer for Northumberland), and Dr. Alex. Collins (tuberculosis officer for West Ham) also took part in the discussion, the majority of them disagreeing with compulsory removal.

The subject for the afternoon session was:—

Extent and Nature of Damage Done by Tuberculosis derived from Infected Milk: Methods of Prevention.

The discussion was opened by Mr. John D. Watson (Birmingham). He explained the work done by the Birmingham Drainage Board to eliminate tuberculosis from the cattle on their farms. The first tuberculin test applied to cows in 1908 showed that 60 per cent. of the milk cows and 12 per cent. of the heifers were tuberculous. Recurring tests gave encouragement to proceed, and they appeared to prove that by the maintenance of consistent procedure it was possible (within four years of its initiation and at trifling expense) to eliminate tuberculosis from a herd of short-horned cows, which on the first test showed 60 per cent. suffering from the disease. To free a herd from tuberculosis, he said, was not enough; you must be in a position to maintain the herd in a healthy state. He concluded by saying that, important as the attitude of the farmer towards this question may be, the lamentable indifference of the public is the ruling factor. If only milk were a clear fluid like water, and if the public could only see what is so frequently offered to them as clean milk—quite apart from the pathogenic character of the fluid which is offered—they would realise the importance of what the hygienist is trying to do for them.

Sir GILBERT BARLING (Vice-Chancellor of Birmingham University) said that tuberculosis derived from alimentation was especially prone to attack children, especially in glands of the neck and abdomen and bone and joint diseases. He was happy to say, however, that these diseases were distinctly fewer than when he commenced practice 40 years ago. He recommended the appointment of a commission on the question of the pasteurisation of milk, and suggested that something could be done in this direction by the conference.

Mr. JOHN FRASER (surgeon, Royal Hospital for Sick Children, Edinburgh) stated that he had analysed figures for the past ten years and regretted to say that he saw no signs of diminution of surgical tuberculosis amongst children. He considered that the increasing incidence of the present day was most likely due to the widespread unemployment and poverty among our hospital classes. He stated that he was a believer in the overwhelming importance of the bovine infection, and claimed that future investigation would show that it is of even greater importance than we now suspect. The elimination of the bovine infection resolves itself into the preservation of milk from infection, and to secure this the proper means is to arrange for the production and the preparation of the milk that the possibilities of contamination be reduced to a minimum. The first essential of a pure milk production, he stated, is a herd of healthy cows, and this could be guaranteed by the institution of periodical tuberculin tests and the immediate elimination of any animals which react.

Sir HENRY GAUVAIN (medical superintendent, Lord Mayor Treloar Cripples' Hospital, Alton and Hayling Island) exhibited some extremely interesting and instructive lantern slides showing what air therapy and heliotherapy had done towards cures of surgical tuberculosis. He believed that 50 per cent. of the cases of spinal caries, lupus, and infected glands were due to bovine tuberculosis, and no form of food-supply had caused more deaths than the milk-supply of this country.

Mr. BRENNAN DE VINE (chief veterinary officer for Birmingham) stated that during the past 15 years 56 herds of cows had been tested, under the Birmingham scheme, and 37·8 per cent. of the animals had been affected with tuberculosis. He stated that in attempting to eradicate a widespread disease such as bovine tuberculosis in this country, assistance should be offered by the State in order to relieve the burden which falls upon the owner of live stock to the benefit of the general community.

Dr. HAROLD SCURFIELD thought that bovine infection of the human being could be stopped if milk were sufficiently heated. The diminution of the mortality rate of non-pulmonary tuberculosis was largely due to the fact that mothers have been giving their children milk which had been rendered safe by heating.

Mr. WILFRED BUCKLEY (of the National Clean Milk Society) Dr. W. T. MUNRO (medical superintendent, Glenlomond Sanatorium), and Dr. J. WHEATLEY (Shropshire) also took part in the discussion, the latter stating that he did not agree with Dr. Fraser's statement that surgical tuberculosis was on the increase, statistics showed otherwise.

Prof. J. ROBERTSON advocated the pasteurisation of milk and stated there had been an enormous reduction in the mortality from non-pulmonary tuberculosis due to better supervision of the infective consumptive and to the strenuous efforts to free herds from tuberculosis. He stated that Birmingham figures show that non-pulmonary tuberculosis was now a little more than one-third as prevalent as it was 20 years ago.

The annual meeting of the Association and conference of branches was held at the University at 5 P.M., and was presided over by Sir ARTHUR STANLEY. After the usual business of the meeting was over a discussion took place on

Work of Tuberculosis Care Committees; and How the Branches of the Association and Other Kindred Societies can Assist.

Dr. FRANCIS J. H. COUTTS (senior medical officer, Ministry of Health) opened the discussion, and was followed by Miss MCGAW (member of the Council N.A.P.T.) and Mr. G. W. ALLEN (Director, Tuberculous Ex-service Men's Society). They emphasised the necessity of after-care societies to help patients after discharge from sanatoriums. Temporary financial help was not what Care Committees should give. It was the function of a Care Committee to look upon the family of a consumptive as a unit, the whole income of the family should be considered, and the best means found to assist that family in order to enable the patient to live and work under the most satisfactory conditions possible. The necessity for choosing the right type of women for visitors was emphasised; they should be women with plenty of tact to whom patients could feel they could go as a friend and not as an official.

A reception given by the Lord Mayor and Lady Mayoress was held at the City Art Gallery in the evening.

(To be concluded.)

Reviews and Notices of Books.

THE BLOOD-SUPPLY TO THE HEART.

In its Anatomical and Clinical Aspects. By LOUIS GROSS, M.D., C.M., Douglas Fellow in Pathology, McGill University, and Research Associate, Royal Victoria Hospital, Montreal. London: Henry Frowde and Hodder and Stoughton. Pp. 171. 25s.

DR. Louis Gross's monograph on the "Blood-Supply to the Heart" gives an account of the results of his researches on this subject and the special technique which he has employed. Each chapter also contains a short summary of the work of previous investigators and a sketch of the present state of our knowledge in that particular branch of the subject with which it deals. The material was investigated by means of X ray examination after injection with suitable material, and the hearts were finally cleared in oil and sectioned. In the opening chapter the actual technique employed is described in sufficient detail to enable other workers to carry out the method for themselves.

The most striking feature of the book is an interesting series of photographs, which have been very beautifully reproduced, showing the alteration in the relative richness of the blood-supply to the two sides of the heart at different age-periods. At birth the vascularity of the right and left ventricles is approximately equal, but as age advances a marked left-sided preponderance develops, corresponding to the muscular preponderance which has been studied by Müller and other observers. The relative anæmia of the right ventricle is considered to be a potent factor in the ætiology of those diseases which are most liable to prove fatal in old age. In discussing the blood-supply to the valves of the heart, the author puts forward the suggestive hypothesis that the site of election of valvular endocarditis is largely dependent on the vascularity of the different valves at different age-periods. In fœtal life it is the right heart which is most frequently involved. In adults, on the other hand, although relatively few normal valves show a culature, it is the aortic cusp of the mitral valve ch most commonly does so, and it is this cusp which ıost frequently found to be the seat of endocarditis. ıer chapters deal with the normal distribution of coronary arteries, the variations which are liable occur, and the veins of the heart. The important stion of anastomosis between the coronary arteries liscussed; and in this connexion Dr. Gross lays siderable stress on the importance of the increased mess of anastomoses, and the supplementary bloodply from the *arteriæ telæ adiposæ*, which are present the later years of life.

This book demonstrates the value of radiography in s particular branch of anatomical research, and the ıring which anatomy may have upon the clinical blems of cardiology.

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e Sympathetic Nervous System in Disease.

Second edition. By W. Langdon Brown, M.A., M.D., F.R.C.P., Physician with Charge of Outpatients, St. Bartholomew's Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 161. 10*s.* 6*d.*

The first edition of this book received favourable tice in The Lancet some three years ago. It s been thoroughly revised and new material incorrated. In its present form it contains a general count of visceral disease in relation to dysfunction the sympathetic nervous system, and is suggestive many instances rather than conclusive. What is king largely is pathological confirmation of the esumed faults in the sympathetic mechanisms ncerned in disease-production. We are still greatly ignorance whether a strict line can be drawn tween organic and functional sympathetic disorder; ıen changes in sympathetic ganglia are found stologically we may still query their relationship the clinical phenomena. The truth is that in the ıdy of this part of the nervous system a rational ıpiricism has not as yet been succeeded by a body of ctrine based on pathology. Dr. Langdon Brown clearly aware of the tentative nature of some of his nclusions and admits that some of the views rather favour to-day are no more than plausible speculaons. A beginning has been made, none the less; e sympathetic system is no longer a terra incognita, ıd the clinician is justified in seeking an explanation various clinical types in impairment of sympathetic nction, however far it be from the stage of objective oof. The book has a good index and useful references the literature at the end of each chapter.

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hronologia Medica.

A Hand-list of Persons, Periods, and Events in the History of Medicine. By Sir D'Arcy Power, K.B.E., F.R.C.S., and C. J. S. Thompson, M.B.E. London: John Bale, Sons and Danielsson, Ltd. 1923. Pp. 278. 10*s.* 6*d.*

This is an excellent and useful little book, ıough as the authors say in their preface the biographies are not intended to be complete, nor does ıe list purport in any sense to be a history of edicine. But it contains a vast amount of information and, we must add, some curious omissions. here is no mention of John of Burgundy, otherwise ohannes de Barba, or John Burgoyne, who may ave been the author of Mandeville's travels and ho is well known as the author of a treatise upon he Black Death of 1348, many MSS. of which are British libraries. Still more strange is the omission f any mention of Victor Horsley. But there are also ntries of the names of comparatively unknown ioneers in sundry branches of science, such, for ıstance, as that of Henry Hickman (1800–1829), a eneral practitioner of Ludlow, who carried out xperiments on animals under anæsthesia by nitrous xide in 1828. Chronologia Medica may be proud f noting him, for his name has escaped the nets both of the Dictionary of National Biography and of Garrison's History. Another interesting entry is that of Adamantios Koraes, otherwise known as Coray, who was a Greek and M.D. of Montpellier (1748–1833). He was a translator of medical books, who left a vast accumulation of notes for an edition of Hippocrates, and he edited the treatise "Airs, Waters, Places," an edition held to be the best extant. On p. 101 we find the following, which, though not exactly inaccurate, is a very loose statement. "1547 St. Mary of Bethlehem Hospital for the Insane founded in London, though Bedlem had been used as an asylum since 1377." An uninstructed reader coming to this passage would imagine the Hospital of St. Mary of Bethlehem and Bedlem to be two different institutions; he would also not gather that the Hospital of St. Mary had really been founded in 1247 as a priory and was first called "hospital" in 1329. The "foundation" in 1547 was of the same nature as the "foundation" of St. Bartholomew's Hospital in 1546, a grudging return of property grabbed by Henry VIII. at the beginning of the Reformation. On p. 45 we note that the elder Bachtishua has his Christian name transliterated as Dschordschis. Why the authors went out of their way to print this queer combination of letters when the simple word "George" would have answered all purposes we do not know. We imagine that it is a French transliteration of the name "Georgees" (to spell it phonetically). Despite these blemishes the book will be found a valuable compilation.

Atoms.

By T. C. Wignall and G. D. Knox. London: Mills and Boom, Ltd. 1923. Pp. 288. 7*s.* 6*d.*

This is a brave attempt, and a very considerably successful one, to explain in popular terms the structure of the atom so that the mystery in which its potential energy is enveloped may be to some extent straightened out for the unscientific. The opening chapter plunges us straight into the story when two of the characters sitting in a railway carriage discuss the possibilities of a *sou* found in the train. Says one of them, "About the most worthless thing one could discover," to which the other replies, "It contains energy equal to 80 million horse-power." The gentleman who thus spoke was "a Johnny on the point of harnessing the atom" according to a popular description of some of his fantastic theories, and he proceeds to explain in simple language, as far as such language will cover the ground, what is meant by atoms, molecules, and electrons, incidentally alluding to the fact that a Greek financier, who is striving to corner the output of the electric workshops of Europe, is anxious to have him for a partner on the ground of his written views. Thereafter follows a thoroughly exciting and well-planned sensational novel, in which the idea is to show what would happen if the atom could be successfully broken up and unlimited energy thereby obtained. As far as has been possible, in dealing with such a theme, the intention has been to be simple, and many associated theories and modern developments have been strictly left on one side. And why not? For, after all, the study of the structure of the atom is extremely recent work, and it is quite likely that some of the results of that work will be found far more valuable than others, while new ideas may be found passing from the realm of fancy to the realm of accepted fact at any moment. It is an excellent notion to familiarise the reading public with the great conceptions of science. It is always quite impossible to follow these great conceptions in laboratory terms, even if the author has the technical qualifications for such writing, unless the reader is an advanced thinker and practical worker himself. To such "Atoms" may or may not appeal. But for a less-equipped audience it may be said that the reading of this novel will place intelligent persons in a position to understand the direction of much modern work and some of its tremendously important meaning. They will be helped to reach this position by a well-planned story of adventure, and we have no hesitation in recommending its perusal.

Endocrine Glands.

Einführung in die Klinik der Inneren Sekretion. By Prof. Dr. G. Peritz, Nervenarzt in Berlin. Berlin: S. Karger. 1923. With 31 illustrations. Pp. 257.

Among various contributions to our knowledge of the endocrine glands and their disorders Dr. Peritz's monograph should take a worthy place. Didactic rather than critical, it contains a fair schematisation of present-day knowledge, which is dealt with under the headings of pituitary, pineal, gonads, adrenals, pancreas, thyroid, parathyroids, and thymus respectively; pluriglandular syndromes receive consideration, on a somewhat meagre scale, while attention is also given to the difficult question of the interrelation of the ductless glands and the nervous system. There are very many references to the appropriate literature of the topics handled, but none to the sources of information, which is matter for regret and detracts from the usefulness of the book. Tables of symptoms and classification of syndromes help the reader to systematise his knowledge.

Epidemic Encephalitis.

L'encéphalite épidémique. By Dr. Louis Reys. Paris: A. Maloine et Fils. 1922. Pp. 144.

This brochure is a clinical study of 150 cases of epidemic encephalitis which occurred in Strasbourg and in Lower Alsace during the period 1919–21. The writer, as Chef de Laboratoire in the Neurological Clinic of the Faculty of Medicine at Strasbourg, had opportunity for carefully recording the clinical phenomena exhibited by the cases and for tracing the tragic after-effects of the malady; from this aspect his study is a fairly complete and useful one. Like some other French authors, Dr. Reys errs, in our opinion, in an over-elaboration of clinical types. Such complexity of classification tends to bewilder the student, whilst those who have investigated similar epidemics deprecate the exaltation of one particular sign or symptom—which, in varying degree, may be seen in all forms of the disease—into the artificial picture of a type. Vertigo frequently occurs in epidemic encephalitis; it is true that when associated with ataxy it may indicate the involvement of the cerebellum, as the histological work of Marinesco proved in 1918, but we hesitate to believe with Dr. Reys that vertigo with ocular disturbances constitutes an essential labyrinthine form of encephalitis, or that further subdivision may be made into pure and associated varieties. In the clinical after-effects noted in this Alsatian outbreak most of the forms so admirably investigated by Mlle. G. Lévy at the Salpêtrière were observed. Of the cases with post-encephalitic sequelæ, paralysis agitans amounted to 40 per cent. approximately; the majority of cases occurred immediately or within one year after the acute attack.

Ocular Neurology.

Manuel de neurologie oculaire. Second edition. By F. de Lapersonne and A. Cantonnet. Paris: Masson et Cie. 1923. Pp. 416. 20*s.*

In this, the second edition of an extremely useful work, the authors have succeeded in producing a valuable and up-to-date treatise on ocular neurology, which cannot fail to appeal both to the student and to the practitioner. The book is divided as before into two parts. The first deals in an admirably clear and detailed manner with the anatomy and physiology of the nervous mechanism of the eye, with the symptomatology of its various pathological states and with methods of clinical examination. The second part, which has been enlarged and brought up to date, contains an account of the ocular manifestations of various nervous and general diseases. This section would bear still further amplification.

The book strikes us as being primarily suited to the student. The anatomical descriptions are particularly lucid and good, though we venture to disagree with the rather low value (21°) given for the angle between the orbital axis and the mid-line. We should also like to have seen a fuller description of the mechanism of production of the various clinical signs. Of course this must be very largely controversial, but it would add much to the interest of the work if the realms of hypothesis were occasionally entered. For example, the student would be more likely to remember the existence of the Tournay reaction if he were given some idea, even if necessarily purely speculative, of its mechanism. The illustrations are good, with the exception of the two presentations of the fundus oculi, which might with advantage have been replaced by plates from any standard text-book of ophthalmology.

Diseases of the Heart.

Herzkrankheiten. By Privatdozent Dr. P. Schrumpf, Assistent am Med-poliklinischen Institut der Universität Berlin. Leipzig: Georg Thieme. 1922. Pp. 200. 4*s.* 7*d.*

This book, it is stated, is intended for the student and the general practitioner, and for further information on the subject the reader is referred to the author's larger work "Klinische Herz-diagnostik," 1919. The first two chapters set out anatomy and clinical methods for investigating the heart. The next 15 chapters deal with diseases of the heart, and the final chapter discusses treatment of the various forms of heart disease. The description of methods is meagre, and not sufficiently explicit to be of use to those who would be likely to read such an elementary book. The chapters on diseases of the heart are clear and readable, but require to be supplemented by the use of a larger book. The value of the tracings reproduced, which are drawings of the originals, is diminished by the unfortunate absence of time markings.

On the whole, considering the brevity of the volume, the author has selected wisely.

Autobiographical Studies in Modern Medicine.

Die Medizin der Gegenwart in Selbstdarstellungen. Vols. I. and II. Edited by Prof. L. R. Grote, Privatdozent at the University of Halle. Leipzig: Felix Meiner. 1923. Vol. I. Pp. 239. 8*s.* Vol. II. Pp. 250. 8*s.*

Prof. Grote's personal contribution to the first volume is limited to an 11-page introduction in which he points out that the history of medicine, like history in general, is the record of its great men. To attempt to sketch the development of medical science as an impersonal thing would be not only to rob it of colour, but also of form. So he has induced six of his most prominent colleagues to give short autobiographical records of the parts they played in developing their respective specialties. After his prologue, the editor retires, and the rest of the book contains the life-histories, with portraits, of Alfred Erich Hoche, Hermann Kümmell, Felix Marchand, Friedrich Martius, Wilhelm Roux, and Robert Wiedersheim. The second volume includes autobiographies of Dietrich Barfurth, Paul Grawitz, Ferdinand Hueppe, Hans Horst Meyer, Franz Penzoldt, F. Julius Rosenbach, Friedrich Schultze, and Hugo Schulz. It is probable that the information thus provided during the life of, and by, the person concerned is more reliable than the average obituary notice which is so often stultified by blind observance of the rule "De mortuis . . . ." But though a biopsy may yield fuller and more accurate information than a necropsy, there are certain difficulties attached to the former method, however anæsthetic the auto-vivisector may be. The six leaders of the medical profession who have turned their insides out for the benefit of their colleagues are to be congratulated on the conscientiousness and skill with which they have performed their allotted task. To be at once truthful and modest in such a matter must be very difficult indeed.

THE LANCET.

LONDON: SATURDAY, JULY 21, 1923.

RESEARCH IN MENTAL DISEASE.

THE Medico-Psychological Association of Great Britain and Ireland completed last week in London its eighty-second annual meeting. The atmosphere of the meeting was one of expectancy; at the annual banquet Lord ONSLOW expressed his belief that the Mental Treatment Bill would become law before the end of the year, when the Statute-book would no longer recognise the term "lunatic asylum." Sir ERIC GEDDES, speaking impressively on the same theme, was sure that the use of the term "mental hospital" would greatly benefit the attainment of the objects of the Association. He alluded to the vast field for research, for investigation, for treatment, and for cure, now open to the mental hospitals if adequately supported; if the case were put before the public clearly and definitely the response, he said, would be overwhelming. Every alienist knows that research must come first and provision has actually been made for research in the Bill. Dr. EDWIN GOODALL'S presidential address to the Association was largely taken up with an inquiry into the rôle played by toxic bodily conditions in disorders of the mind; and Dr. HENRY COTTON, lecturer in psychopathology at Princeton University, made a very convincing statement of his own experience in regard to chronic sepsis. Five years given up to the study of endocrine disturbance and gland therapy in functional mental order had led him to no decisive result, but eradication of chronic sepsis had been rewarded by an immediate increase in the recovery rate of his patients from 37 to 85 per cent., so that he had come to regard disease of the brain tissue as the fundamental condition, and psychogenic factors as precipitative rather than causative of psychosis. Other notable contributions at this meeting were Dr. C. LOVELL'S discovery in anxiety cases of increased nucleation of the interlobular connective tissue of the pancreas, an observation by Sir FREDERICK MOTT and Dr. IDA ROBERTSON of complete atrophy of the cellular elements of the pituitary body in dementia præcox, and Dr. J. WALKER'S demonstration of vagotonia in the same condition.

Already a number of mental hospitals have appointed an additional medical officer, whose time will be devoted chiefly or wholly to pathological investigations. There are a few examples, among which Cardiff City Mental Hospital is perhaps the most noteworthy, of institutions possessing extensive laboratories and a comparatively large staff of investigators. In a large hospital, especially in one connected with a university, such a development of this side of the work is eminently desirable and feasible. It is impossible, however, for work of this nature and extent to be undertaken in every mental hospital in the country; routine work of a simple nature can be undertaken with advantage, but more difficult work must often be sent elsewhere, and deliberate research will demand facilities which are available only in specially equipped laboratories. These considerations have led to the establishment of central laboratories designed to serve a group of mental hospitals. An example of such work is afforded in the thirteenth annual report of the Scottish Western Asylums' Research Institute. Much of the work done during the year has been of a routine nature, and medical officers from the asylums interested have attended the institute in order to acquire a knowledge of laboratory technique. At the same time several lines of research have been followed—mainly of a chemical nature, including an investigation of the blood-sugar content in emotional states, and determination of the basal metabolic rate in dementia præcox. In some cases where the underlying cause appeared to be infective, autogenous vaccines have been prepared, and an attempt was made to influence conditions apparently due to intestinal auto-intoxication by administering milk soured by the *Bacillus acidophilus*. This interesting experiment yielded improvement in general health, although no effect was observed on the mental condition of the patients.

A similar venture on a somewhat larger scale is represented by the Birmingham Pathological Laboratories at Hollymoor Mental Hospital, which have been established by the Joint Board of Research for Mental Disease, and were opened at a meeting held on June 16th, attended by the Minister of Health. These laboratories, which are under the direction of Sir FREDERICK MOTT, are equipped for all varieties of work, and for purposes of routine investigation are intended to serve the mental hospitals of the Midlands. Mental hospitals are invited to coöperate, either by making an annual contribution or by sending material for examination at charges to be fixed by arrangement. At present there are, unfortunately, legal restrictions which prevent the authorities of mental hospitals from contributing adequately to such a scheme as this, and the Birmingham laboratories are dependent in part on funds which have been raised privately. The present arrangements are regarded as only a beginning, and it is probable that the department will be transferred later to the Birmingham University Laboratories, where the work will be in direct association with the general pathological work of the University.

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THE INTERNATIONAL CONGRESS OF SURGERY.

THE International Society of Surgery has just concluded in London its Sixth Triennial Congress. We are able to print this week a report of the inaugural session at which the delegates were officially welcomed and Sir WILLIAM MACEWEN delivered a presidential address, and of the first scientific session which was devoted to reports and discussion on the surgery of endocrine glands. We have had among us a body of men whose names are household words in their profession. Twenty-four countries, ranging from Roumania and Poland to Chili and Peru, have sent their greatest surgeons to tell us of their discoveries, to inspire us with their own enthusiasm, and to stimulate us to emulation. In the amazing progress which surgery has made in the last 30 years Britain has taken her full share, and the sons of HUNTER and of LISTER are not unworthy of their great ancestry. But just because British surgeons have striven to keep in the van, they are the better able to appreciate the great men of other countries who have fought so hard to wring from Nature the secrets of their art, and they are the more eager to applaud the victories they have won. Towering above them all in age and experience, the very Nestor of surgery, is William Keen. Eighty-six years of life and 64 of surgery have still left him young, and it is difficult to realise that he was a pioneer in America when Lister was still feeling his way towards antisepsis, and when abdominal surgery was a distant dream. William Mayo, of Rochester, the head, with his brother, of the greatest surgical organisation in the world, brings with him Donald Balfour, one of his ablest captains. From its vast resources the Mayo Clinic provides a formidable proportion of the surgical literature of the world, and we owe no small part of modern abdominal surgery to its leaders. Representing American orthopædics we have Edville G. Abbott, who has done so much to improve the treatment of spinal curvature. Charles H. Frazier represents neurology, and to him we owe many ingenious methods for dealing with the difficult problems presented by the gasserian ganglion and pituitary tumours. George Crile has come to teach us how to operate by stealth, so that even the subconscious nervous system of the patient may not be injured by the operation which he cannot feel. From Canada we welcome Frederick G. Banting, whose discovery of insulin has revolutionised the treatment of diabetes and given a powerful stimulus to the study of the endocrine glands. France has always been famous for her surgeons, and her list includes many familiar names. Theodore Tuffier calls to mind brilliant advances in thoracic surgery, A. Gosset and René Leriche in the surgery of the peripheral nervous system. Henri Hartmann in gynæcology and Louis Bazy in the urinary tract are masters, whilst to De Martel we owe a whole range of ingenious instruments which he applies with exquisite skill in the surgery of the brain. Belgium sends us Charles Willems, whose daring methods of treating war infections of the knee by mobilisation revolutionised our outlook on the surgery of septic joints, and Albin Lambotte, one of the pioneers in the surgery of the bones and in the operative treatment of fractures. Prof. V. Putti, from the famous school of Bologna, has shown us how to obtain from amputation stumps movements never before thought possible. From Berne, made famous by Theodor Kocher, comes Fritz de Quervain, to whom we owe a brilliant book on surgical diagnosis, and who is one of the greatest living authorities on endemic goitre. A few names chosen at random from a long list can give little idea of the brilliant intellects who have met at the Congress. Still less can a few short sentences give any adequate conception of the treasures which years of labour have enabled these men and their colleagues to hand down as a priceless possession to posterity. The surgeons of Britain are indeed proud to welcome a body of men, every one of whom has added lustre to a great profession, and the people of Britain will rejoice that through the lips of our own Prince Ambassador they were able to pay homage to those whose devoted labours have won such blessings for humanity.

THE SPAHLINGER TREATMENT.

The paper on the Spahlinger vaccine by Dr. E. H. Colbeck and Dr. S. Roodhouse Gloyne, and the letters on the same subject published in this issue of The Lancet add a good deal, but not as much as we want, to our knowledge of this subject. We are told of the results, immediate and late, of this treatment in a considerable number of cases, and we are left by Dr. Colbeck and Dr. Gloyne to draw our own conclusions. In withholding the panegyric with which new remedies are usually ushered into the world, they have acted with wisdom as well as with restraint, and have proved themselves conversant with the history of therapeutics. The usual record of a new remedy may be illustrated as a tracing—a sharp rise, a culmination of brief duration, and a slow decline ending either at a low level or, sad to say, in the base line of oblivion. This last is the fate of many remedies, as we all know. Yet the incorrigible optimism of man is doubtless an asset to the race, and the indiscriminate scepticism of the senior medical student towards the youthful therapeutic enthusiasms of his teachers is sometimes ill-founded. We may then do well to scrutinise the evidence supporting the Spahlinger case before we discard it as unproven. A perusal of the cases hitherto published brings out one very important point. They were, as a rule, advanced cases, and in many the disease was active as well as advanced. To undertake the cure of an early case of tuberculosis is often like rushing to the aid of the victor; it is not infrequently a work of supererogation. During the recent tuberculin revival, "cures" were effected in persons whose only sign of tuberculosis was a positive tuberculin reaction. If, and we would emphasise this *if*, the Spahlinger treatment is uniformly and permanently beneficial in febrile cases with signs of advanced pulmonary disease, then the viability of this treatment is assured. But, considering how erratic the course of even advanced and febrile pulmonary tuberculosis may be, we must have many more records than we possess at present of the results of this treatment; the *ex uno disce omnes* principle must be reversed. Another point is concerned with the experimental evidence in the case. Is it supported by controlled guinea-pig and other animal tests? More human beings recover from, than die of, infection with the tubercle bacillus, and man is therefore for this, as well as other reasons, an unsuitable test subject. But the guinea-pig experimentally infected by the tubercle bacillus almost invariably dies in a few months. Has the tuberculous guinea-pig been cured by the Spahlinger preparations?

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but here in this room we are not the whole Congregation. We are surrounded by the faces of the unforgotten dead who require of us that we accord no honour to success unless that success has been attained with due regard to certain ancient principles which are still the glory of the profession.

I will therefore say—firstly, that every new fact uncovered and every new idea conceived in Rochester has been freely and promptly communicated to the profession, and the whole surgical world have been free students of the Mayo Clinic; secondly, that the inheritance of an ancient obligation has been faithfully accepted and the afflicted poor have a generous share in the benefits of the institution; thirdly, that success and praise have in no way misguided the workers in their quest for perfection. Emerson has said that if a man can do something, even the making of a mouse-trap, better than anyone else, no matter where he hides himself, the world will make a beaten path to his door. Mayo has proved this true, but those who know him know that no one is more likely to slip into the Surgeons' Valhalla murmuring apologies for the quality of *his* mouse-trap; and lastly, that the work of this notable family has contributed substantially to the diminution of that terror of the knife which has hitherto added so much to the distress of afflicted humanity.

Therefore, Prof. Jamieson concluded, it is not only as the promoter of a colossal enterprise and as a distinguished figure in surgical research, but as a true man, modest, charitable, and humane, that in the name of this Congregation I present to you William James Mayo for the Degree of Doctor of Science.

THE BEIT MEMORIAL FELLOWSHIPS.

AT a recent meeting of the trustees of the Beit Memorial Fellowships for Medical Research, Sir James K. Fowler, the honorary secretary, presented a review of the fellowships from their beginning in 1910 to 1923. During that period, said Sir James Fowler, 79 fellowships had been awarded; but for the war this number would have been considerably greater. In 1914 nearly the whole body of Fellows resigned in order to join one or other of the public Services; all of these who so desired were ultimately reinstated, but during the war years very few appointments were made. The value of the fellowships, originally £250 per annum, was in 1919 increased to £300, and in 1920 to £400; in 1922 they were classified as junior fellowships (value £350 per annum), fourth-year fellowships (£400), and senior fellowships (£600). The main object of this classification was to remove, as far as possible, the objection that the fellowships opened up no career to those possessed of the spirit of research and likely to become qualified for the highest positions in teaching and research work. It was now possible for candidates to see seven years ahead—three as a junior fellow, one as a fourth-year fellow, and three as a senior fellow. The income of the trust for the last financial year was about £11,500. In April, 1922, a report on the after-careers of the first 50 Fellows showed that two had gained fellowships of the Royal Society, four had become directors of research institutes, eight were professors, eight university lecturers, three were hospital physicians in charge of special and research departments, one was on a scientific research expedition. One only was engaged in medical practice. Four women Fellows had married, and most of the others were holding responsible appointments or pursuing independent research. Of the 29 Fellows since elected, 16 still hold fellowships. After the report had been received, the trustees proceeded to the election of Fellows. The number of candidates was 36, the largest since the first election. The following are the names of the elected candidates, with an indication of the direction of research or proposed research:—Senior Fellowship: Dr. David Keilin, life-history of parasitic protista and physiology of parasitic metazoa. Fourth-year Fellowship: Miss Katherine H. Coward, D.Sc., investigation into processes of metabolism, nutrition, and growth of young animals, particularly with references to deficiency diseases. Junior Fellowships (ten were awarded instead of six as stated in the advertisements, on account of the high qualifications of candidates): Dr. J. M. H. Campbell (1) oxygen consumption and pulmonary ventilation during and after work in chronic heart and lung disease, and total metabolism and "efficiency" of work in these and other diseased conditions; (2) changes in capillary circulation in the skin in dermographia, urticaria, angioneurotic œdema, and certain chronic nervous diseases. Dr. C. G. Lambie, influence of insulin upon fat and protein metabolism. Mr. W. K. Slater, M.Sc., (1) completion of work on a correction of the value for the heat of combustion of glycogen, (2) determination of the molecular weight of glycogen, (3) partial supervision in the initial chemical work in the extraction of insulin, (4) investigation of cell mechanism under anaerobic conditions. Dr. Dorothy S. Russell, the relation of renal efficiency tests to the morbid anatomy and histology of kidneys. Mr. C. P. Stewart, M.Sc., (1) investigation of methods of isolation and chemical constitution of thyroxin, (2) continuation of research on liver perfusion of substances related to histidine. Mr. H. J. Channon, B.Sc., study of certain fundamental dietary factors in the nutrition of living organisms. Mr. William Smith, B.A., and Mr. Lewis B. Winter, B.S., investigations on general metabolism in health and disease, with special reference to metabolism of carbohydrates and the cause of diabetes. Miss D. B. Steabben, B.Sc., investigation of mechanism of response to injection of colloidal substances. Mr. C. S. Hicks, M.Sc., (1) investigation of the causation of goitre from a biochemical standpoint, (2) chemistry and pharmacology of substituents in the thyroxin molecule.

BRONCHIAL ASTHMA DUE TO MICE.

Dr. William Lintz,[1] clinical professor of medicine in the Long Island College Hospital, remarks that while emanations from all sorts of animals have been known to cause attacks of bronchial asthma, there is no case on record in which emanations from rats or mice have been the cause of such an attack. The following case which recently came under his observation is therefore the first example of mice being the cause of bronchial asthma. The patient was a married woman, aged 36, who had been suffering for the last seven years from typical attacks of bronchial asthma which occurred four or five times a month, mostly at night, only occasionally in the day-time, and chiefly from December to March. The attacks did not appear to bear any relation to food, weather, or the emanations from the cat, horse, or dog. All laboratory examinations and cutaneous allergic tests proved negative. No cause could be detected for the attacks, which were relieved by injection of adrenalin, until Dr. Lintz in examining the patient's premises was struck by the number of mouse-traps scattered about the house and learnt that the place was infested by rats and mice. It then occurred to him that the asthmatic attacks might be due to mice for the following reasons: (1) The attacks occurred from December to March, when the mice had left the fields for food and warmth in the house. (2) They usually took place at night, when the mice were running about the house. (3) When the patient stayed at her mother's house, a short distance away, in which there were no rodents, she was free from the attacks, which recurred as soon as she returned home and lay down in her bedroom. The correctness of the hypothesis was confirmed by exposing the patient to the emanations of a mouse without her knowledge, so as to exclude all psychical influence by placing the animal in a covered box and asking her to smell it at a time when she was perfectly free from asthma. Three minutes later she had a typical asthmatic attack associated with intense dermatitis. A very energetic campaign against the rodents in the house was then undertaken, and after removal of a few dead rats from beneath the patient's bedroom floor she remained free for three years from all attacks. The case proves, as Dr. Lintz remarks, that cases of bronchial asthma are pieces of research work, and often require a knowledge of the patient's environment before the problem can be solved.

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[1] New York Medical Jour. and Medical Record, June 20th, 1923.

business meeting which concluded the programme some interesting cases were shown. These included cases under insulin treatment, shown by Dr. M. G. Thackrah, and a case of splenic enlargement for diagnosis, by Dr. A. M. Hutchison; a case of ovarian tumour simulating pregnancy by Dr. Frances Huxley; triplets, all with congenital hearts, by Dr. Helen Ingleby; and a case of mental deficiency with catatonia in small child by Dr. E. M. Pickard. Miss E. C. Lewis showed specimens of double ureter attached to a kidney with partial hydronephrosis, ureteric calculi, and pyelograms, while Dr. Hilda Whittingham had on view interesting slides of tumours of doubtful malignancy. These absorbing side-shows, while leading to much valuable discussion, were not allowed to detract from the holiday atmosphere of an afternoon almost in the country, for though easily accessible from central London the hospital appears to be surrounded by much open space. Altogether it was a most cheerful function. Dr. Louisa Martindale, supported by Lady Briscoe and Dr. Amy Sheppard, expressed the thanks of the Association to the medical and nursing staff for their hospitality, and more than one guest was heard to hope that the opening of the new surgical block, now in process of construction, would give occasion for another medical garden party at the South London Hospital for Women.

IS REINFECTION OF TUBERCULOSIS FROM WITHIN OR FROM WITHOUT?

COULD this question be definitely answered, one way or the other, the problems of tuberculosis, notably those concerned with prophylaxis, would be greatly simplified. If the Andvord-Römer hypothesis is correct, and the active pulmonary tuberculosis of adult life is merely the final stage of a long and consecutive train of events beginning with infection in childhood, the adult who gives a positive tuberculin reaction has little to fear from contact with sputum-positive cases of tuberculosis. To most rules there are exceptions, and in his latest communication Dr. K. Andvord has clearly pointed out that he does not regard the risk of exogenous infection among adults as perfectly negligible. Dr. Braeuning,[1] of Stettin, seems, however, to have come to the conclusion that exogenous reinfection is not merely of occasional, but of common occurrence. His opinions are founded on statistical observations which, though open to criticism from several points, are exceptionally interesting and instructive. Several lines of research were followed. First he took stock of the 244 families in Stettin, in each of which there was a case of open tuberculosis notified in 1919. There were 1077 persons in these families—i.e., there were 833 contacts. What, he asked, was the incidence of open tuberculosis among these contacts during 1919, 1920, and 1921 as compared with that of the whole population of Stettin? The answer was illuminating. Among the contacts there were 27 new cases of open tuberculosis in the three years under discussion—i.e. 32·4 per thousand. In the same period in the general population this ratio was only 5·4 per thousand. In other words, the incidence of new cases of open tuberculosis among the contacts was between five and six times as high as in the general population. Dr. Braeuning discusses various sources of error in his comparison, and he notes that as these errors did not operate only on one side, they tended to neutralise each other, and were in any case negligible in view of the striking differences in the two tuberculosis rates. He has, however, omitted to mention one important factor or possibility which might bring the Andvord-Römer hypothesis in line with his own findings. The 27 persons who developed open tuberculosis within a few years of the notification of an earlier case in the same house may have been exposed to the same infection many years earlier—in childhood. If, for example, a man, aged 25, develops pulmonary tuberculosis in 1919, and his sister, aged 23, develops the disease in 1920, and it transpires that their mother died of pulmonary tuberculosis when they were still infants, who shall say that the sister contracted the disease from her brother in 1919 and not from her mother two decades or more earlier?

Dr. Braeuning was not, however, satisfied with only one line of research. He grouped his contacts in four classes, according as the hygienic conditions under which they lived were good, bad, or somewhere between these extremes. There were 218 persons living under good conditions, save that they were in contact with a case of open pulmonary tuberculosis. Only 1·3 per cent. of these contacts developed open tuberculosis in the period 1919–21. But of the 122 contacts living under the most unhygienic conditions, as great a proportion as 4·9 per cent. developed open tuberculosis in the same period. At a casual glance these figures certainly suggest that particularly favourable opportunities for exogenous reinfection explain the marked differences in the number of new cases of tuberculosis in the two classes. But the matter is not really so simple. For contacts living in poverty, dirt, and squalor are subject to many noxious influences besides that of massive infection, and these other influences cannot be dismissed as negligible. The contact living in hygienic surroundings is probably receiving better pay, is less overworked and underfed than his fellow-contact in a slum. And, it may be argued, he is comparatively immune, not because infection is less massive in a clean than in a dirty home, but because his opportunities for maintaining acquired immunity are comparatively great. A third line of research open to the same criticism as the first was an inquiry by Dr. Braeuning of 100 patients suffering from open tuberculosis as to their having been in contact with cases of pulmonary tuberculosis shortly before their own disease developed. The same question was addressed to 100 non-tuberculous patients. A history of exposure to infection was obtained between two and three times as often (2·7 to be exact) in the first as in the second class. Dr. Braeuning argues that all his lines of research converge on one point; exogenous re-infection of tuberculosis is very common. It may be. But valuable as Dr. Braeuning's researches are, it cannot be claimed that they are the last word in this matter and a complete answer to the heading of this annotation.

A TRIBUTE TO THE MAYO CLINIC.

AT a Congregation of Leeds University, held on July 13th in the School of Medicine, the honorary degree of Doctor of Science was conferred by Sir Michael Sadler upon Dr. W. J. Mayo of Rochester, Minnesota. In presenting Dr. Mayo, the Dean of the Faculty of Medicine, Prof. J. K. Jamieson, spoke as follows:—

> The remarkable institution called the Mayo Clinic in Rochester, U.S.A., emanates from the brains of the Mayo family, father and sons. Even were it permissible to describe it in a degree oration, that could not be done in the Latin or English forms in use in our universities; it would require the happy amœbic pseudopodia of ancient Greek or the still developing collateral anastomoses of the American language to give a true idea of the development of the institution.
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> It stands now as a colossal monument of organising ability founded on the sure rock of tireless work carried on with faith and enthusiasm. It is a notable illustration of what may be done by devoted coöperation. As there is nothing new under the sun one desires to seek its prototype in history. If there be a prototype it is in the Temple of Æsculapius at Kos. We do not know that this ever contained more than the spirit of a genius, and the Mayo Clinic fortunately possesses the body as well; but imagination allows us to draw a picture illustrating the resemblance. Were some catastrophe to dismember civilisation it is quite possible that Rochester would become the second Kos. Therein we might find the buildings tenanted by priests clad in white vestments and masks performing a ritual reminiscent of the surgery of the early twentieth century, and receiving from the faithful tithes of the flocks and herds and corn and oil, and—may we say—wine.
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> The creation and development of an organism which is a fountain of progress in surgery flowing all over the world is surely good reason for our desire to honour its Director;

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[1] Beitr. z. Klin. d. Tuberk., 1923, Bd. lv., Hft. 2.

does no more than repeat experiments and confirm results already amply established, perhaps by workers in Hong-Kong, Christiania, or some South American republic, and printed in full in the native language of the investigator. Most scientific libraries have reliable indices whereby the titles of relevant papers may be found, but the periodical itself may not be among those taken in at the library, and the librarian may be at a loss to suggest where it may be inspected. To fill this need Prof. R. T. Leiper, F.R.S., some time ago suggested to the British Medical Association the production of an index or guide to the libraries in which the very numerous scientific periodicals can be found, and he has now, with the collaboration of Mrs. H. M. Williams and Miss G. Z. L. Le Bas, M.Sc., prepared such an index. The list prepared by Prof. Leiper and his colleagues serves to indicate where much of the periodical literature of medicine and the allied sciences may be consulted, not only in London, but also in Cambridge, Oxford, Edinburgh, Glasgow, Liverpool, and Manchester, and has been compiled from library catalogues and from lists made personally by the compilers. It reveals the important fact that the National Library in the British Museum contains also the most extensive and representative series of foreign medical and scientific periodicals in Britain. The book is being published this week at the price of 10s. 6*d.*, and will be obtainable through any bookseller, or at the offices of the British Medical Association, 429, Strand, London, W.C. 2.

THE RELIEF OF LEPROSY IN THE BRITISH EMPIRE.

ON July 12th, at a meeting held in the India Office under the chairmanship of Lord Chelmsford, it was decided to form a British Empire Leprosy Relief Association. Despite the imperfect statistics available in this connexion, the British Empire is acknowledged to contain more known lepers than any other political unit, but far less is done for these sufferers, in proportion to their numbers, within the Imperial boundaries than in the United States. Less than 5 per cent. of British-governed lepers are now cared for in any way, and of that percentage only a small proportion are receiving the latest form of treatment —a fact mainly due to the poverty of India, tropical Africa, and the West Indies, the countries most affected. The present situation in India is briefly indicated in another column in connexion with the work of the Mission to Lepers.[1] An influential general committee, and a strong executive committee, with subcommittees, were appointed to draw up plans for action by the association, whose establishment and promised activity will be a source of great satisfaction to all who realise the extent of the leper problem in the Empire, and the hope given by recent advances in the treatment of the disease.

ANNUAL MEETING OF THE B.M.A.

THE annual meeting of the British Medical Association opens to-day, Friday, July 20th, at Portsmouth, when Sir William Macewen, the President, will vacate office in favour of the President-Elect, Mr. C. P. Childe, senior surgeon to the Royal Portsmouth Hospital. The time chart of the meeting follows precedent in that the opening and three following week days will be taken up by the annual Representative Meeting, while the Scientific Sections will meet on Wednesday, Thursday, and Friday, July 25th, 26th, and 27th. The annual dinner of the Association will take place at the City Town Hall on July 26th. The exhibition of surgical appliances, foods, drugs, and books will be open during next week, the closing day of which—viz., Saturday, July 28th—has been set apart for excursions to places of interest in the neighbourhood. The hon. local general secretary is Mr. C. A. Scott Ridout, of St. Emo, Clarendon-road, Southsea.

THE house and library of the Royal Society of Medicine will be closed for cleaning and repairs during the whole of August.

Sir Napier Burnett's fourth annual report on the Voluntary Hospitals in Great Britain (excluding London) has just been issued. In an introductory note Sir Arthur Stanley calls attention to the wonderful improvement in financial position shown by these hospitals in 1922, when the ordinary income of 666 hospitals only fell short of ordinary expenditure by £75,000. "Mass contribution" has been successfully called in to redress the balance of the old individual donor who has dropped out. The curious fact is revealed that out of a total of 5179 beds in "cottage hospitals" 2000 were vacant during 1922. Mention is made of increasing laboratory accommodation in hospitals throughout the country and of the establishment by the Red Cross Joint Council of a central bureau of information on hospital matters.

ROYAL MEDICAL BENEVOLENT FUND.

AT the meeting of the Committee on July 3rd 25 cases were considered and £262 voted to 17 applicants. The following is a summary of some of the cases relieved:—

Daughters, aged 51 and 46, of M.D. St. Andrews who practised in Hampshire and died in 1878. Through the death of a brother, whose pension ceased at his death, these ladies are in somewhat straitened circumstances, having had to find the money for the brother's funeral. After his estate is cleared up they do not expect their income to exceed £30 per annum each. The elder sister received £30 from sewing, and the younger £20 as a journalist. The rent amounts to £1 per week. Voted £20.

Daughter, aged 54, of M.R.C.S. Eng. who practised at Mold and died in 1871. Applicant was a school nurse, but since May, 1922, she had pneumonia, and has not been able to carry on her work and is now suffering from degeneration of the cerebellum. Her brother will allow her 5*s.* per week and friends have given her £5. She receives board and lodging in return for light household duties. Voted £18 in 12 instalments.

Widow, aged 63, of M.R.C.S. who practised in Cheltenham and died in 1920. Through rheumatic fever and congestion of the lungs applicant has only earned £40 during the last 12 months. Youngest son was studying medicine, but owing to death of father had to give it up and take a post in a bank. Applicant has had an offer to go to B.C. to look after some children, but has not the means to go. Voted £5.

Widow, aged 49, of M.R.C.S. Eng. who practised in Wales and died in 1910. A brother-in-law has aided the applicant to the extent of £15 per annum, but he has now retired and is unable to continue this assistance. This money was used to pay the eldest daughter's travelling expenses to and from school, and the applicant asks the Fund if they can make a grant for this purpose. Voted £10 in two instalments.

Subscriptions may be sent to the honorary treasurer, Sir Charters Symonds, K.B.E., at 11, Chandos-street, Cavendish-square, London, W. 1.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

SMALL-POX IN ENGLAND AND WALES.—During the week ending July 7th 145 cases of small-pox were notified (the largest number this year) in England and Wales, the distribution being as follows: Derbyshire 15 (Alfreton 1, Long Eaton 13, Shardlow R.D. 1); Durham 1 (Stockton-on-Tees "doubtful"); Gloucestershire 93 (Gloucester 91, "including 18 cases of chicken-pox rediagnosed as small-pox," Gloucester R.D. 1, Stroud R.D. 1); Lancaster 1 (Colne); Nottinghamshire 22 (Kirkby-in-Ashfield 8, Sutton-in-Ashfield 14); Westmorland 1 (Windermere "doubtful"); Wilts 1 (Swindon); Yorks West Riding 8 (Huddersfield 1, Bentley-with-Arksey 1, Doncaster 1, Doncaster R.D. 5); Flintshire 1 (Flint); Monmouth 2 (Rhymney 1, Risca 1).

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[1] See p. 153.

ON SMALL-POX DIAGNOSIS.

THE recent spell of tropical weather, which lasted continuously for nearly a fortnight, has synchronised with some remarkable cases of chicken-pox, of such a nature that further notes may be helpful to those faced with similar cases should the hot weather recur. The striking feature of these cases of chicken-pox has been the profuseness of the rash upon certain sunburnt surfaces such as the forearm and neck; and also the extreme severity of the rash, so that the secondary fever has reached a temperature of 103° F. in one and 104° in another of the cases. It seems that it is the flushed, sweaty, and irritated condition of the skin which has led to some of these severe rashes. They form good illustrations of the value of attaching due weight to all the evidence. One of these cases may be quoted:—

H. B., male, aged 14, was covered from head to foot with a most copious rash, the total number of his spots amounting to probably at least 1500. An approximate count of his spots showed as follows: Right hand, palm 5 faint spots, back of hand 50 to 70, right forearm 100 to 150, right arm 150 to 200. Left hand, palm 3 faint spots, back of hand 40 to 60, left forearm 60 to 80, left arm 100 to 140. Face 200 to 300, front of chest and abdomen 400 to 500. In the left armpit were 20 to 30 spots and in the right armpit 15 to 25; on the sole of the right foot about 10 to 20 spots, left sole 8 to 12 spots. A temperature of 104° F. was reached during the suppuration of the pocks. It was noteworthy also that at the onset, but for the occurrence of the spots, neither the patient nor his mother would have noticed any illness in him at all. The lesions, notably on the trunk, were superficial with crenate outline, irregularly oval, the long axis running parallel to the natural folds of the skin; in fact many of them individually were precisely typical of chicken-pox, the only unusual feature being their extreme abundance. They had matured at a much more rapid rate than would have been possible in variola. The boy had been vaccinated in infancy and showed four plain scars. There had been chicken-pox among some vaccinated children in the house. Another striking case was that which occurred in two children who recently had been spending a holiday at the seaside and whose legs had been so scorched by the sun that there was mild acute sunburn. The rash of chicken-pox had picked out these children's irritated surfaces in a very remarkable degree; here again the diagnosis was rendered perfectly clear by the concomitant signs. In yet another case the neck and upper part of the back had been remarkably picked out by the rash of chicken-pox, owing presumably to that area having been partly sun-scorched and partly chafed due to the clothes bearing on a perspiring surface.

While the rash of both small-pox and, to a less degree, of chicken-pox favours irritated surfaces, a more intense degree of hyperæmia may be required in chicken-pox than in small-pox to bring out this peculiar phenomenon. The suggestion is worth following up should the heat continue.

A Case of "Mild Small-pox" as at Present Prevalent in Gloucestershire.

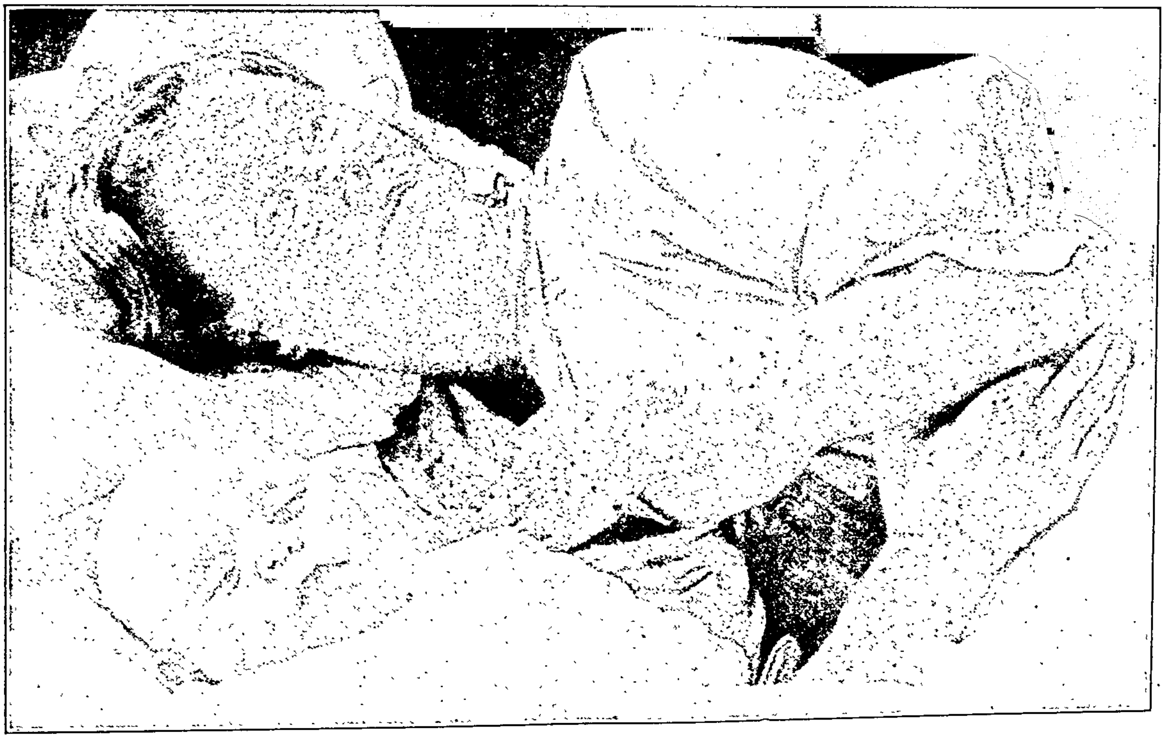

Photo by H. C. Leat, Gloucester.

By the courtesy of the Ministry of Health and with the permission of the patient we reproduce herewith a photograph of Mrs. A. and baby taken at Gloucester on June 26th and showing the characteristic eruption of small-pox with its well-marked centrifugal distribution on face and arms. Mrs. A., aged 26, was notified as suffering from small-pox on June 15th and admitted to hospital on the same day. The onset of prodromal symptoms was on June 9th with headache, vomiting, and pains all over; the rash appeared on June 12th, profuse and coherent on face, arms, and legs, giving rise for four days to a secondary temperature of 100°–101° F. Desquamation was practically complete on July 16th. At the time of admission to hospital Mrs. A. was nursing a baby who accompanied her. The baby was successfully vaccinated in four places on the arm on June 16th and has remained free from infection. Mrs. A. continued to nurse the baby during her illness.

HELP IN THE SEARCH FOR REFERENCES.

THE time and physical energy wasted in the search for references by anyone engaged in the pursuit of scientific investigations disheartens on occasion the most zealous worker. If he neglects even one possible source of information, which may be specially difficult of access, he may be punished by finding just before or even after publication that his research patient makes an effort to open his bowels each morning after breakfast. If he fails, an ounce of glycerine is injected. Should this prove successful, the next morning one drachm of the ounce is replaced by water, and on successive days the strength of glycerine is steadily reduced till eventually an ounce of water with no glycerine is used. By this time the patient is generally cured, but it is occasionally necessary to continue with the water in diminishing quantity for a few more days. Sometimes glycerine does not act satisfactorily. Graduated water enemas should then be substituted; if a pint is found to act well, the amount used should be reduced by one ounce every day till no more injections are required.

Massage and Exercises.

In severe cases of colonic constipation massage is of the greatest value. The first treatment should be given after the patient has had an opaque meal; he lies on the X ray couch under the fluorescent screen, so that the masseur can be shown the exact position of the colon, the part chiefly affected, and what manipulations are required to influence it. In dyschezia, and in some cases of colonic constipation, massage is very useful for improving the condition of the abdominal muscles. Swedish exercises are still more valuable. In the numerous cases of dyschezia, which are due to weakness of the muscles of the abdominal wall and pelvic floor, daily exercises for some weeks produce excellent results. The muscles of the pelvic floor should not be forgotten, as in women who have borne children weakness of the levator ani muscle is a very common factor in the production of dyschezia. The patient should be taught to draw in her anus, just as if she were trying to prevent a liquid stool from being evacuated; she then relaxes. This exercise should be repeated 30 times every morning and evening whilst lying in bed. Not only does it help to cure the dyschezia, but it quickly overcomes minor degrees of rectal and vaginal prolapse.

Regular exercise in the open air is very beneficial. Slight constipation can often be cured by inducing a man to walk a couple of miles on his way to business; though unable to open his bowels directly after breakfast, he will have no difficulty on arriving at his office. A man who is busy during the week should take as much exercise as possible on Saturday afternoon and on Sunday, and he should have adequate annual holidays to prevent over-fatigue, both mental and physical; this is an important factor in many cases of habitual constipation.

Surgery.

There is no surgery of habitual constipation. Ileo-sigmoidostomy, and partial and complete colectomy are—or should be—dead. Grave organic disease leading to intestinal stasis is not included under "habitual constipation"; it calls, of course, for operation. But in the absence of this, surgery is as much out of place in disorders of the colon as it is in functional disorders of the stomach.

ARTHUR F. HURST, M.D. Oxf., F.R.C.P. Lond.,
Physician to Guy's Hospital.

Previous articles in this series are:—
I. Medical Treatment of Gall-Bladder Disease, by Sir Humphry Rolleston. II. Early Pulmonary Tuberculosis in the Young Adult, by Dr. Claude Lillingston. III. Neuralgias of the Head and Neck, by Dr. Wilfred Harris. IV. Whooping-Cough, by Dr. T. Izod Bennett. V. Scabies and Pediculosis, by Dr. H. W. Barber. VI. Abdominal Injuries, by Prof. Charles A. Morton. VII. Aural Discharge in Children, by Mr. Harold Barwell. VIII. Vaginal Discharge, by Mr. A. W. Bourne. IX. Minor Injuries to the Eye, by Sir J. H. Parsons. X. Epilepsy, by Dr. Gordon Holmes. XI. Inguinal Hernia in Childhood, by Mr. C. W. G. Bryan. XIV. Club-foot in the Newly-born, by Sir Robert Jones. XV. Intestinal Worms, by Dr. R. Hutchison. XVI. Primary or Spasmodic Dysmenorrhœa, by Dr. G. Blacker. XVII. Measles, by Dr. Foord Caiger. XVIII. and XIX. Heart Failure, Preventive Treatment, Therapeutics, by Dr. J. Parkinson. XX. Gonococcal Epididymitis and its Bearing on Sterility, by Mr. Kenneth M. Walker. XXI. Ante-partum Hæmorrhage, by Dr. T. Watts Eden. XXII. Ringworm, by Dr. A. Whitfield. XXIII. Cystitis, by Mr. J. B. Macalpine. XXIV. Hæmorrhoids, by Mr. R. M. Rowe. XXV. Puerperal Sepsis, by Lady Barrett. XXVI. Cyclic Vomiting, by Dr. G. F. Still. XXVII. Asthma, by Dr. E. P. Poulton. XXVIII. Traumatic Rupture of the Urethra, by Mr. G. Grey Turner.

Special Articles.

IMPERIAL CANCER RESEARCH FUND.

ANNUAL REPORT.

THE twenty-first annual report of the Imperial Cancer Research Fund, under the direction of the Royal College of Physicians of London and the Royal College of Surgeons of England, was submitted at the annual meeting of the Fund held on July 17th, the Duke of Bedford, President of the Fund, being in the chair.

Honorary Treasurer's Report.

Sir George Makins, honorary treasurer, in his report, stated in the past year subscriptions to the Fund had amounted to £951 11*s.* 6*d.*, being an increase of £447 1*s.* 0*d.* on the previous year, and several legacies of considerable amount had been received, totalling £3,675 15*s.* 6*d.* The amount of £4000 promised by Mr. and Mrs. Todman last year has been received, and in addition, through the munificence of an anonymous benefactor, the Alice Memorial Fellowship, amounting to about £500 per annum, had been endowed. It was earnestly to be hoped that supporters would continue to contribute to the Imperial Cancer Research Fund, as by so doing they would be supporting researches which have proceeded without cessation since the year 1902.

Secretary's Report.

It was announced that the lease of the farm hitherto occupied by the Fund expires in September, and that a portion of the land acquired by the Medical Research Council at Mill Hill has been leased from the Council for 21 years. It is hoped that the close association between the two staffs in the laboratories to be built at Mill Hill may be of considerable benefit to scientific investigation.

The conditions agreed on for the prize offered by Lord Atholstan for the discovery of a cure for cancer are set out, and include a provision that all applicants must in the first place satisfy a recognised medical faculty or a leading medical society in his or her own country (*a*) that there is some scientific basis to justify experimental investigation of the professed cure, (*b*) that any cases said to be successfully treated were, in fact, cases of cancer, and one that applicants must disclose to the medical faculty or medical society investigating the professed cure its nature and ingredients, and the method of its preparation. Lord Atholstan's grant to the Fund for research has been utilised by the appointment of Dr. A. M. Begg to carry out an investigation on the subject of the infective sarcomata (dogs and fowls) with a view to defining the difference, if any, between them and true neoplasms. In March last the liberal offer of an anonymous donor to found an "Alice Memorial Fellowship" for cancer research under the auspices of the Imperial Cancer Research Fund was accepted, and Dr. Marshall Findlay has been appointed the first "Alice Memorial Fellow." The list of scientific papers published by members of the staff during the year is an imposing one. Material from the laboratory has been sent to 13 workers at home and abroad. A considerable portion of the annual report is devoted to an account of the negotiations between the executive committee of the Fund and the committee of the British Empire Cancer Campaign. When the Fund was first approached early in April of this year by the promoters of the Campaign with a view to its coöperation, a resolution was passed that before the Imperial Cancer Research Fund agrees to coöperate with the British Empire Cancer Crusade in organising and carrying out cancer research, it must be satisfied as to the conditions to be adopted in allocating the money to be raised by the appeal. At another meeting on April 18th, as the result of further correspondence, it was agreed that the Fund did not see its way to associate itself with the cancer crusade unless

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXIX.—THE TREATMENT OF HABITUAL CONSTIPATION.

The general public usually believes that it is capable of diagnosing and treating habitual constipation for itself. Consequently a patient rarely comes for advice who is not already under treatment prescribed by himself or his friends. In many cases his symptoms are due to his pills rather than his constipation, and it is impossible to make an accurate diagnosis, upon which satisfactory treatment must depend, until he discontinues to use his remedies for a few days.

My investigations with the X rays between 1907 and 1909 led me to classify habitual constipation broadly into two forms: (1) colonic constipation, in which there is delay in the passage of fæces from the cæcum to the rectum, and (2) dyschezia, or inefficient defæcation, in which the patient has lost the power of expelling the contents of the rectum. In colonic constipation the cæcum and ascending colon, or less frequently some other part or the whole of the colon, is found on abdominal palpation to be distended with fæces, but digital examination shows that the rectum is empty. On the other hand, in dyschezia the rectum is full, although the patient is generally unaware of this and is quite incapable of emptying it; no accumulation of fæces is present in the rest of the bowel, except sometimes in the pelvic colon. An accurate diagnosis can only be made with the aid of the X rays, which show exactly what part of the colon is involved in colonic constipation, whilst in dyschezia they show that the passage as far as the rectum is normal in rate. In my experience the two forms of constipation are about equally common, many of the most severe cases being examples of dyschezia. Colonic constipation, if untreated, is much more likely to give rise to toxic and other symptoms than dyschezia, which generally leads to nothing more than inconvenience and slight local discomfort, unless it is treated by aperients and other unsuitable measures, which themselves give rise to toxæmia by irritating the colon and keeping it full of fluid fæces, which form an excellent medium for bacterial activity.

In general colonic constipation requires treatment by diet, and, in severer cases by drugs and massage, and dyschezia by persuasion and exercises, and, in severer cases, by graduated enemas. In both attention to the

Hygiene of the Bowels

is essential. Constipation can generally be prevented by proper attention to the hygiene of the bowels, and most mild cases, especially of dyschezia, can be cured in this way. The individual should have a cold bath on getting up, or at least a cold douche over the abdomen and back after a warm bath, and should not breakfast in bed. He should rise sufficiently early to allow plenty of time for his visit to the water-closet, which he should never fail to make after breakfast, even if he feels no desire to open his bowels. If the bowels do not act, he should try again after a walk or after lunch or dinner. The water-closet should be well ventilated, but not too cold. The seat should be low enough to allow a crouching position to be adopted; if necessary, a footstool should be provided; in severe dyschezia a bed-pan should be placed on the floor, over which the patient can squat. Too much attention should not be paid to the subject; the patient should realise that "his bowels were made for man, not man for his bowels." For many one action on alternate days is sufficient; occasionally even longer intervals are normal, and I have known very healthy people with unusually greedy colons, who were never well if their bowels opened more than once a week.

Diet.

All cases of habitual constipation are benefited by taking a suitable diet, and in slight cases this should make the use of drugs unnecessary. The guiding principle is to give plenty of fruit and green vegetables, which leave an adequate residue to act as a mechanical stimulus to intestinal activity, and in most cases also contain chemical stimulants to peristalsis. It is a good plan to take ten or a dozen stewed prunes as well as jam or marmalade for breakfast every morning, and fruit, either raw or stewed, and green vegetables either cooked or in salad, both at lunch and dinner. A diet of this kind is particularly necessary in cases of habitual constipation caused by a greedy colon, in which the absorptive power of the bowels is developed to an abnormal extent. In such cases the addition of a teaspoonful or more of powdered agar-agar to porridge, potatoes, or stewed fruit at each meal is useful, as it expands by the absorption of moisture, and, being almost completely indigestible, adds bulk to the otherwise insufficient fæces.

Drugs.

For colonic constipation a drug is required which stimulates the colon without unduly irritating it, and the dose employed should be one which produces a single formed stool each morning. In my experience senna is, as a rule, the most satisfactory, and it has the great advantage that the patient can accurately regulate the dose he takes from day to day. In a case of moderate severity seven senna pods should be tried the first evening. The number can then be increased or diminished according to the result obtained, and when the right dose is discovered the patient should make frequent attempts to reduce it by one pod every other night. The pods should be soaked in cold water for three hours, and the infusion should be drunk either at dinner-time or on going to bed. Hot water extracts a griping element from the pods, which is absent from the cold infusion. If any griping still results, one minim of tincture of belladonna should be added to the infusion for each senna pod.

Liquid paraffin passes through the alimentary canal without undergoing any change. It is quite inert, but as Neville Wood, who introduced it to the profession in 1899, first pointed out, it makes hard fæces soft, and so causes their passage through the bowel and their final expulsion from the rectum to be comparatively easy. It is therefore valuable in dyschezia as well as in colonic constipation. It can be used in addition to any other methods of treatment; if, for example, half an ounce is taken after breakfast and after dinner, the dose of senna required in a case of colonic constipation is much reduced.

Enemas.

In the majority of cases of habitual constipation there is a tendency for an accumulation of fæces to occur. If abdominal or rectal examination has shown that this is the case, the bowels should be thoroughly washed out before any other treatment is begun. In very severe cases of colonic constipation a douche should be given daily for two or three weeks, the quantity used being gradually reduced from an initial injection of a pint and a half. The efficacy of the treatment is greatly increased by having the colon massaged whilst the water is still present in it. The fluid should be run in at a pressure no greater than 18 inches, the quantity used should never exceed a pint and a half, and the tube should not be inserted more than two inches from the anus. The X rays have proved that fluid introduced in this way always reaches the cæcum unless organic obstruction is present, and that a tube introduced more than 4 inches—as with the old-fashioned "high enema" of the so-called Plombières treatment—simply curls round and round in the rectum and irritates its mucous membrane, as it is almost impossible for it to pass round the pelvic-rectal flexure into the pelvic colon.

If re-education alone fails to cure a case of dyschezia, graduated glycerine enemas should be tried. The

The report showed that the Fund continued to pursue its considered policy of coöperation with the workers in different laboratories coupled with the interchange of material; such coöperation and coördination must, however, be voluntary and could not be forced on the workers.

The President then proposed, and Dr. Sidney Martin, F.R.S., seconded, the adoption of the report. Sir William Church was elected a Vice-President on his resignation of the chairmanship of the executive committee.

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Objects of the Scheme.

The object of the Association was to induce people, while in health, to make provision for the time of serious illness and to enable its members to obtain such services other than ordinary—i.e., general practitioner—treatment as they might require in illness without additional charge, and the services provided included inter alia: the ordinary services of a coöperating hospital, consultations at home in *serious illness*, the services of visiting nurses, treatment at the Radium Institute when required, and the use of ambulances.

It was decided: (1) That the scheme should be provident—i.e., that the subscriptions should be of such amount as would in the aggregate meet the cost of the services required without encroachment upon charitable funds. (2) That the administration should be in the hands of a neutral body which should impartially guard the interests of all concerned. (3) That the work of the general practitioner should not be interfered with, but that, as far as possible, he should be helped in his work for the benefit of those of his patients who were members of the Association. (4) That all benefits under the scheme should be obtained on the recommendation of the private medical attendant of the member. (5) That there should be no interference with the existing rules or routine and work of the hospitals or of any other bodies concerned. (6) That the income limit prescribed for members should, as nearly as possible, be in accordance with the income limits of those ordinarily admitted to hospital treatment.

An Experimental Year.

Arrangements had also been made for group membership on the same principles at a lower rate of subscription which would cover the hospital services only, but this branch was transferred to the Hospital Saving Association, who also took over and carried through the incorporation which had been applied for to the Board of Trade. The income of £1770 for the period was allocated beforehand as follows, viz.:

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Of the 2315 members 56, or 2·4 per cent., were in-patients during the year and their average stay in hospital was 23·8 days, while 258, or 11 per cent., were treated as out-patients or received special services, such as X ray, massage, electrical treatment, laboratory investigations, &c., the returns showing a total of 1378 attendances, or an average of 5·4 per patient. The payments to coöperating hospitals amounting to £1150 10s. are equivalent to a payment of £5 7s. 1*d.* a week for each in-patient and of 10s. for each out-patient, and include any provision which the hospitals may have made for a payment to general medical staff funds. Consultations in the patients' own homes were paid for by a fee of 3 guineas for each consultation. The amount allocated to nursing has been paid in full, but after paying for all the services rendered during the period, a balance of £406 remains in hand upon the other accounts, after all liabilities to members have been finally discharged.

Change of Name and Incorporation.

The committee feel that the year's experiment has fully justified their anticipations, and the statistical results encourage them to hope that in a system of provident coöperation lies the solution to the financial problem of the voluntary hospitals.

The report is signed by Sir Arthur Stanley, Lord Dawson of Penn, Mr. W. McAdam Eccles, Sir Alan G. Anderson, and Dr. J. F. Gordon Dill (hon. secretary), members of the Executive Committee.

On May 9th, 1923, the Association was registered under the Companies Acts, as a company not for profit, under the title of the British Provident Association for Hospital and Additional Services, the signatories to the memorandum and articles of association in addition to those named above being Lord Knutsford and Captain J. M. Gordon Dill.

RESEARCH IN TROPICAL DISEASE.

IV. THE WELLCOME BUREAU OF SCIENTIFIC RESEARCH.

THIS Bureau was founded towards the end of 1913 by Mr. Henry S. Wellcome, who, in 1902, had presented the laboratories bearing his name to the Sudan Government, and who has, in many directions, evinced his keen interest in tropical research. For the first few years of its existence the Bureau was housed at 10, Henrietta-street, Cavendish-square, but, subsequent to the war, removed to the premises it now occupies at 26, Endsleigh Gardens alongside the London School of Tropical Medicine, with which it has the privilege of coöperating in certain directions. From the start it has been under the direction of Dr. Andrew Balfour, formerly in the Education Department of the Sudan Government, director of the Wellcome Tropical Research Laboratories, Gordon Memorial College, Khartoum, and medical officer of health for that city.

The Bureau exists not only for purposes of research, more especially in connexion with tropical medicine and hygiene, but also with a view to supplying information gratis to medical men, sanitary administrators, and others interested in these subjects. From small beginnings it rapidly progressed, and though for a time its routine activities were curtailed by the war, the whole of its scientific staff being employed on military duties in one capacity or another, and for the most part abroad, work was resumed thereafter and has developed in various directions. There is now a deputy director, Lieut.-Colonel G. E. F. Stammers, R.A.M.C. (retd.), and departments of protozoology, pathology, bacteriology, helminthology, and entomology have been formed. In connexion with the last named, Mr. Wellcome has established a field laboratory at Wisley, Surrey, where work is carried out on mosquitoes and other insects of medical interest. An important feature of the Bureau is the large teaching and research museum of tropical medicine and hygiene arranged on graphic and somewhat novel lines; of which Dr. S. H. Daukes is the curator. This museum is freely open to all who may care to visit it, and arrangements are made whereby lecturers may bring their students and impart other cancer research institutions were invited to take part and to receive similar financial support. The Fund suggested that the following institutions should be invited to occupy a similar position in relation to the crusade—namely, the Cancer Hospital, the Middlesex Hospital, the Radium Institute, the Manchester Cancer Investigation, the Liverpool University Cancer Committee, the Glasgow Cancer Hospital, and the Marischal College, Aberdeen, the attitude of the Fund depending on that of the majority of these institutions. The Fund deprecated any appeal to the public based on the supposition that if large sums of money are provided a cure will be found at an early date. The committee of the British Empire Cancer Campaign did not at first (May 2nd) see their way to invite the bodies mentioned to appoint representatives, and consequently it was considered inadvisable by the executive committee that the Fund should participate in the Campaign.

Subsequently, as the result of further correspondence, numerous interviews, and an intimation that most of the institutions interested in cancer research above referred to had been invited and that some had agreed to join in the campaign, the executive committee on May 16th decided to appoint five representatives to the grand council of the Campaign. Since this time further difficulties have arisen, certain clauses in the Articles of Association of the Campaign, which had not previously been disclosed to the executive committee of the Fund, not meeting with their approval; but in view of the proposed modifications in the Articles of Association, including the formation of a scientific committee which shall advise on the allocation of funds for scientific research, it is believed that the Imperial Cancer Research Fund will be able to coöperate in the Campaign.

Speech of Chairman of Executive Committee.

The report of the Director, Dr. J. A. Murray, was well summarised by Sir William Church, chairman of the executive committee, in moving the adoption of the report. He said:—

Vitamin Deficiencies.—The laborious study of vitamin B and vitamin A deficiencies in which Dr. W. Cramer has been engaged for the last three years may now be considered as completed. Neither of these deficiencies, nor both combined, arrested the growth of cancer, even when pushed to a degree incompatible with life. The great adaptability of the cancer cell to changes in its environment frustrated the hopes which were aroused by the discovery of the profound influence of these food accessories on the growth of young animals. In the course of these researches a striking similarity was found between the effects of vitamin deficiencies and the damage produced by radium and X rays. The study of this relation was made possible by the close and friendly collaboration of Dr. Mottram of the Radium Institute.

Tissue Culture.—The improvement Dr. Drew has made in the methods of tissue culture outside the body have enabled him to add considerably to our knowledge of the factors which control the differentiation of tissues, and also of the mechanism of repair after injury. Using the growth of normal tissues in vitro as an indicator of the presence of active substances in the culture medium, he has proved that differentiation of epithelial cells is mainly controlled by the interaction of the connective tissues with them. When connective tissue cells are absent, the characteristic form and arrangement of the epithelial cells do not appear. The addition of connective tissue cells to an undifferentiated sheet of epithelial cells is quickly followed by typical differentiation. The process can be reversed, and repeated at will. The same holds good for cultures of transplantable new growths. Extremely undifferentiated mammary carcinoma can be turned in vitro into an adenomatous structure very similar to developing mamma. These results are a further step in the elimination of unimportant details from the cancer problem. Loss of differentiation when it occurs in cancer, is not a fundamental permanent feature as has long been supposed. It is superficial and may disappear without corresponding change in malignancy.

Repair of Injury.—The way in which injury sets repair agoing has been studied and throws an interesting sidelight on the growth of cancer. While embryonic tissues and tumours start growing at once when placed in a suitable culture medium, tissues from adults, even if young, only start growing after an initial delay which may be as long as 14 days. If adult kidney be ground up with saline solution and incubated for two hours and then filtered, the addition of the filtrate to the culture medium starts adult tissue growing at once. An extract of unincubated damaged kidney has no such power. An extract of undamaged rapidly growing carcinoma or sarcoma, however, is as active as the extract of incubated kidney. The cancer cells produce in the ordinary course of their existence substances which normal tissues elaborate only in response to injury.

Scientific Report.—A scientific report will be published in the autumn giving an account of these researches of Dr. Cramer and of Dr. Drew, as well as further observations by Dr. Murray on the difficulty met with when the attempt is made to produce a new carcinoma by tar painting in animals in which primary cancer has already appeared. The extension of Dr. Russell's work on carbohydrate metabolism of normal and cancerous tissues to the pentoses, and other papers, will also appear in it.

Statement of Progress Achieved.—As this is the last occasion on which I shall move the adoption of the annual report, I hope I may be permitted to occupy your attention a little longer with a brief statement of the progress achieved in the 21 years I have been chairman of the executive committee. When the Fund started cancer was generally believed to be a disease of civilised man. A parasitic causation was very widely believed in and those who regarded such a causation as unlikely in carcinoma were ready to admit its probability for sarcoma. We know now that cancer occurs in all races of mankind and in all vertebrate animals. The sarcomata have finally taken their place alongside the carcinomata as malignant new growths of connective tissue. Their frequency increases as age advances in the same way as the former, and sarcoma or carcinoma can be produced at will in laboratory animals according as the specific irritant is applied to connective tissue or to epithelium.

The rôle of chronic irritation in starting cancer has received experimental proof. Incidentally a rational explanation of the characteristic age incidence of cancer has been provided at the same time. The influence of heredity can be relegated with considerable certainty to the transmission of an enhanced sensitiveness to specific forms of irritation. The transplantability of new growths to healthy animals has made a careful study of their essential features possible. The phenomena of resistance to transplantation and tissue immunity with their curious limitations have been studied in detail. The explanation of the failure of these methods to furnish a means of treatment for cancer has made more precise our conception of the meaning of individuality in the higher animals. In all these investigations the Imperial Cancer Research Fund has played its part, in many of them a leading part. The present annual report shows that the working organisation is still vigorous and competent, and in laying down the duties of chairman of the executive committee I wish the Fund a successful future with confidence.

President's Speech.

The President said he was in complete agreement with the attitude taken by the executive committee, with reference to coöperation with the British Empire Cancer Campaign.

The President understood that a subcommittee appointed by the grand council of the Campaign had decided to make certain recommendations for embodiment in the Articles of Association, including the appointment of an advisory committee to include members nominated by the Royal Society and by the Medical Research Council in joint consultation. In the event of these modifications being carried out they would secure the confidence and coöperation of bodies engaged in cancer research, including the Imperial Cancer Research Fund, because in their opinion the future administration of the Campaign would then be guided by those whose knowledge would enable the best use to be made of all funds available. It was obvious from letters and articles which appeared from time to time in the press that incredibly little was known of the work that had already been done by this Fund and by other research bodies in this country and abroad—for instance, the information regarding cancer collected by the Imperial Cancer Research Fund relating to the disease in native races throughout the empire and of its occurrence in all species of the animal kingdom. For this reason it would seem to be essential that the administration of the Funds of the Campaign should be in the hands of those who know what experimental work has already been done, and what information on the subject has already been accumulated. By these means useless repetition would be avoided and public money used to the best advantage.

The report showed that the Fund continued to pursue its considered policy of coöperation with the workers in different laboratories coupled with the interchange of material: such coöperation and coördination must, however, be voluntary and could not be forced on the workers.

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Affiliated to the Bureau are the Wellcome Chemical Research Laboratories, which conduct researches in various departments of organic and inorganic chemistry and are specially concerned with plant analysis. Under Dr. T. A. Henry, late of the Imperial Institute, they collaborate with the Bureau in the investigation of native drugs, poisonous plants, spear, arrow, and fish poisons, and other matters intimately bound up with research in tropical medicine. The Bureau is also recognised by the Medical Research Council as an institution where its research workers may carry on investigations, and at the present moment two of its staff are engaged upon inquiries, dealing respectively with trypanosomiasis in British sheep and rat-bite fever.

Since its inception the Bureau has published over 100 papers dealing with many fields of tropical research, and has issued two volumes, one on tropical hygiene, the other on protozoology. As examples of the kind of work which has been undertaken, there may be cited the papers by Dr. C. M. Wenyon on malaria, intestinal protozoa, hæmatozoa, and Weil's disease; those by Dr. A. C. Stevenson on sleeping sickness, *Leptospira icterohæmorrhagiæ* in rats and the histopathology of typhus fever; those by Major H. C. Brown, I.M.S. (retd.), on remedies for dysentery; those by Dr. W. N. F. Woodland on porocephaliasis and on certain worms found in Nile fish; those by Mr. M. E. MacGregor on mosquitoes in England, and on myiasis; and those by Mr. G. C. Dudgeon on tropical fruit foods and certain parasites of rats. Joint work carried out with the staff of the chemical laboratories is evidenced by papers on the toxicity of emetine and on the reaction of the medium as affecting the toxicity of certain alkaloids towards protozoa, the latter being based on the combined researches of Dr. Henry and Major Brown. Apart from the war services rendered by the staff in several tropical and sub-tropical war areas, the Director-in-Chief carried out investigations in the West Indies and Central and South America prior to July, 1914, while of late years his services and those of Mr. MacGregor have been utilised by the Colonial Office in connexion with the sanitary regeneration of Mauritius.

In addition to research work in London the Bureau hopes to institute inquiries in the tropics and to link up the work at home with that abroad, where, it may be noted, museums modelled on that attached to the Bureau have been established in certain places, as, for example, Calcutta, Zanzibar, and Dar-es-Salaam.

BERLIN.

(From our own Correspondent.)

The Title of "Specialist."

The title of specialist has not hitherto been officially recognised; its assumption has been left to the discretion of a medical man and to the disciplinary power of his medical society, and the Government has declined to introduce a special examination or an official qualification in this connexion. The title has been abused—some medical men, after perhaps no more than a six weeks' post-graduate course, and sometimes without even that training, have placed it on their doorplates, thereby attracting patients to the detriment of their colleagues. The German Medical Association will deal with the matter at its next meeting; reports will be presented by a general practitioner and by a specialist. The reporters, Dr. Küstermann, of Munich, and Dr. Stuelp, of Mülheim, have published in the *Aerztevereins-Blatt*, the official journal of the Association, the proposals to be made to the meeting. They state that scientific and technical training superior to that of the average medical man is necessary for a specialist. Only the following branches of medical science are to be recognised as specialities: (1) surgery, (2) gynæcology and obstetrics, (3) orthopædics, (4) diseases of the eyes, (5) diseases of the ear, nose and throat, (6) diseases of the skin, venereal diseases, and diseases of the urogenital organs, (7) nervous and brain diseases, (8) radiography and heliotherapy, (9) diseases of the mouth and jaws, (10) diseases of the stomach and intestines and of metabolism, (11) internal diseases, (12) lung diseases, (13) diseases of children. The report states that it should be considered unprofessional to assume the title of specialist for more than one of those branches, except those closely connected—for example, surgery and orthopædics—but even this exception should be valid only for those already in practice; new specialists should choose one branch only. It should also be unprofessional to assume the double title of specialist and general practitioner, as is done in some parts of Germany. Specialist training should last for at least three years, and in relation to surgery, gynæcology, and internal medicine for four years. The intending specialist must have acted as an assistant in a university clinic, in a special department of a large hospital, in an out-patient department, and also as a private assistant to a specialist of good standing, the latter for a time not exceeding one-third of the entire training. A specialist desiring to practise should give notice to the local medical organisation, which will inquire as to whether he has fulfilled the conditions. Inquiry should be entrusted to a board consisting of specialists and general practitioners in equal number. If the board declines to recognise the specialist, the latter should have the right of appeal to the provincial medical chamber.[1] When, notwithstanding a definitive rejection of his claim, he insists on calling himself a specialist, he should be liable to prosecution before the court of honour of the chamber.[1] When treatment by a specialist is no longer necessary, the latter should send the patient back to a general practitioner, and should abstain from general practice himself. The report rejects the idea of legislative intervention in this important question, which, it states, should be left to medical discretion and settled by common agreement of specialists and general practitioners assembled in the next general meeting of the Medical Association.

Meeting of Socialist Doctors.

At a recent meeting of German and Austrian Socialist medical men in Berlin the chairman, Dr. Zadek, formerly a Berlin city councillor, pointed out that the number of socialists was smaller among the medical profession than in any other, as the sick-clubs, of which the great majority are under Socialist control, are somewhat hostile to the medical profession; medical socialists, however, were by their position fitted to settle disputes between these parties. Reports were read on the sick-club question in Germany and Austria; Dr. Epstein, of Munich, said that once the medical man became a State official, as required in the programme of the Socialist party, the struggle between individual medical men and the struggle of the profession against the clubs would cease. Prof. Grotjahn, a member of the Prussian Parliament, proposed that the clubs should appoint medical men for group work in rooms placed at their disposal on sick-club premises, and in hospitals, out-patient departments, and first-aid stations. Patients unwilling to consult the appointed medical men might apply to their club for higher sick-pay, and might then consult a private medical attendant. Dr. Weyl, a Berlin city councillor, advocated the appointment of a limited number of medical men; he believed that in Berlin 1500 medical men would suffice to secure an adequate attendance to club members, instead of the 3000 and more at present engaged in this work. He did not, however, say what would become of medical men excluded in this way. Dr. Kautsky, of Vienna, wished that medical officers elected by the clubs should again stand for election after two years, appointment for life being made dependent upon re-election. This might mean that before definitive appointment candidates would prescribe medicines lavishly and give certificates for sick-pay free in order to obtain votes. It was generally agreed that the nationalisation of the German medical profession as required by the programme of the Socialist party was impossible under the present financial conditions.

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[1] See The Lancet, 1923, i., 156.

Control of New Drugs.

The German Association for Internal Medicine, together with the Association of Sick Clubs, have made arrangements for examination of new drugs produced by chemical manufacturers. A commission has been set up under the chairmanship of Prof. Klemperer to examine the efficacy and cost of new drugs; the commission may base their opinion on pharmaceutical and clinical testimonials produced by the manufacturer provided the certificates shown derive from trustworthy sources. Otherwise the remedy will be sent for pharmacological examination to a university or hospital. The drugs recommended by the commission after examination will be registered and the register published regularly, special mention being made of drugs suitably priced for use in sick-club practice. The clubs have provided the commission with adequate funds, hoping in this way to exclude certain new drugs which do not differ much from older remedies except by their sounding names and higher prices.

Conditions in the Rhenish Spas.

Since the beginning of the Allied occupation the Rhenish spas and health resorts have been in great distress. The majority of German patients decline to go there for sentimental reasons and also because the cost of living is several times more expensive in occupied districts than in the rest of Germany. Medical men practising at the Rhenish spas have appealed to their professional brethren in unoccupied Germany to send more patients; they assert that as the severe measures put into force by the occupying forces affect inhabitants only, the outside patient has nothing to fear and may take his cure as he desires. Many of the spas are of international renown, such as Wiesbaden, Ems, Kreuznach and Neuenahr; Homburg, so well known to English visitors, is not occupied but is seriously affected, being situated only a few hundred yards from the border of the occupied district. These spas were always chiefly, and are now nearly exclusively, frequented by foreigners, but Wiesbaden has now only a third of its pre-war numbers of patients, and Ems only a quarter. The great bathing establishments and kursaals of those spas are thus nearly empty. The loss to a city like Wiesbaden is estimated at milliards, and the municipal authorities have requested the German Government to allow the reopening of the gaming establishment closed by law in 1872. The appeal of the Rhenish medical men to their colleagues outside the Rhineland was, of course, made before the total blockade of the Ruhr and Rhine districts against Germans; but visitors belonging to the Allied nations may go there without special permission, and English visitors will certainly be as welcome as formerly.

ABERDEEN JOINT HOSPITALS SITE.—The Aberdeen town council has offered to dispose of the Burnside and Forresterhill estates to the parties of the proposed joint hospital accommodation scheme at a price of £35,000, the respective proportions of the price and ground being allocated as follows: Corporation (Public Health Dept.), 41 acres, at a cost of £13,335; Royal Infirmary, 36 acres, at a cost of £11,110; Sick Children's Hospital, 17¾ acres, at a cost of £5555; University, 10¾ acres, at a cost of £5000.

BURY INFIRMARY EXTENSION.—Lord Derby, at Bury, on July 14th, laid the foundation-stone of a war memorial, which will be an addition to the Bury Infirmary, and will be used as a children's hospital. The estimated cost, including endowment, is £12,500, of which £10,000 have already been subscribed. On the morning of the opening ceremony an anonymous donor sent bank notes for £1000.

Obituary.

DONALD MURRAY, M.B., C.M. GLASG., D.P.H.

Dr. Donald Murray, sometime Member of Parliament for the Western Isles, died in a London nursing home on July 6th at the age of 60. He was born at Stornoway, in the Isle of Lewis, on Oct. 21st, 1862, and received his medical education at the Universities of Glasgow and Aberdeen, graduating M.B., C.M. from the former in 1890. Taking up general practice first at Brora, in Sutherland, and then in his native burgh, he afterwards, in 1910, obtained the diploma in public health at the University of Aberdeen, and became medical officer of health for Stornoway and the Lewis district, as well as school medical officer for Lewis and the western portion of Ross-shire. He was soon elected to the chairmanship of the school board and a justice of the peace for Ross and Cromarty. Always a keen debater, he presided over the Glasgow Medico-Chirurgical Society when still almost a student, and he became president of the Glasgow University Liberal Club. In 1918 he was returned as Independent Liberal member of Parliament for the Western Isles Division of Inverness and Ross and Cromarty, but was defeated at the last general election by the National Liberal candidate.

Captain Walter Elliot writes: "As secretary of the Medical Committee of the House of Commons I saw a very great deal of Donald Murray during the four years 1918–22, and we soon became fast friends. I think it was impossible for anyone to know Murray without conceiving for him the warmest friendship and admiration. His sincerity, his devotion to the interests of the community which he represented, his gaiety, and, above all, his tremendous humanity, were qualities rarely combined in one man. In political matters he gained the respect of his opponents both by his knowledge and his really extraordinary power of hard work, and as a man it was, I think, the verdict of the House as a whole that he was the only medical member of the House of Commons of any party whom any of us, myself included, would really have wished to see at his bedside in time of sickness. This is perhaps the ultimate test of a man, certainly of a physician, and judged by it the name of Donald Murray stands high indeed."

ETTIE SAYER, M.B., B.S. LOND.,

CONSULTING PHYSICIAN TO THE SOCIETY FOR THE WELFARE OF THE FEEBLEMINDED.

Miss Ettie Sayer died on July 7th after a long illness at the age of 48. She was the daughter of William Sayer, of Bacton, Norfolk, and received her early education at Rossell School, Paignton, Devon, afterwards entering University College and the London School of Medicine for Women, where she was Chesterfield medallist. Graduating M.B., B.S. Lond. in 1889, she became house surgeon to the Tunbridge Wells Eye and Ear Hospital and then registrar to the St. John's Hospital for Skin Diseases, before accepting the appointment of physician to the Cowley Mission to Mahommedan and Kaffir women. In 1901 Miss Sayer was made plague medical officer to the Cape Government, and in this capacity she visited the concentration camps during the Boer war and later the lepers in Robben Island. After her return to England Miss Sayer was assistant medical officer (1902–07) to the Education Department of the London County Council and acted as lecturer on first-aid to that body and to the Church Army nurses. Her interests were many-sided: a Fellow of the Royal Society of Medicine and of the American Electro-Therapeutical Society, she was also a member of the council of the Psycho-Medical Society and of the Eugenics Society, and was the author of articles on the effects of electric currents on blood pressure, on the causes and treatment of inebriety, the deterioration of vision during school life, and on morally defective children, and she wrote a text-book for nurses on medical electricity and light. She was well known as an uncompromising supporter of women's suffrage and of other movements for the benefit of women and children. Miss Sayer's death will be mourned by a wide circle who recognised her pertinacity of aim and honesty of purpose.

Public Health Services.

WILLESDEN MUNICIPAL HEALTH SERVICE.

THE dispute[1] between the Willesden Urban District Council and the Willesden Branch of the British Medical Association has come to an end, the approval of the Ministry of Health having been received for the Council's maternity and child welfare scheme, by which children under school age requiring treatment will be dealt with in the same way as school-children. The scheme is as follows:—

Medical Examination and Advice.—Expectant mothers, nursing mothers, and children under five years may attend the municipal clinics for medical examination and advice, except mothers and children known to be under the care of a private medical practitioner. Mothers known to be under such care may, however, attend lectures or other educational meetings at the clinics.

Clinic Treatment.—(1) Expectant and nursing mothers and children under five years found to be suffering from nits or vermin may be treated at the clinics. Expectant and nursing mothers found to be suffering from minor ailments to the limited extent indicated in Memoranda M. and C.W. 14 and M. and C.W. 4 may be treated at the clinics strictly in accord with the provisions of these memoranda. (2) Expectant and nursing mothers found to be suffering from definite disease or deformity, or conditions other than minor ailments, shall be referred to a private medical practitioner. Children under five years found on examination to be suffering from defects requiring attention, other than nits or vermin, shall be referred to a private medical practitioner. (3) Children under five years found to be suffering from minor ailments, defective eyesight, enlarged tonsils and adenoids, or ringworm (for X rays), and in respect of whom a postcard has not been received from a private medical practitioner intimating that he has undertaken the treatment of the case, and who for good and necessitous cause shown cannot obtain treatment from a private medical practitioner or general hospital, may be treated at the clinics.

Home Confinements.—In cases where the economic circumstances of the family do not exceed the minimum scale figures, midwives, maternity nurses, and home helps are provided for confinements at home, and home helps are provided in connexion with hospital confinements or illness in the expectant mother.

The scheme is practically what the Willesden Division of the B.M.A. have asked for, and is now under the supervision of the chairman of the Public Health Committee and Hospital Subcommittee (Dr. G. W. R. Skene) and the chairman of the Children's Care Committee (Dr. W. Lock), both of whom are also members of the Divisional Executive Committee. These two medical men are largely responsible for the carrying through of the scheme in face of considerable difficulty.

MENTAL HOSPITALS SERVICE.

FOUR COUNTY AND BOROUGH HOSPITALS.

THE annual reports of four county and borough mental hospitals[2] recently published have many features in common, and deal with several matters of medical and public interest. It is, perhaps, not out of place to comment on the very brief and formal style which characterises them. It is frequently difficult to gain from them any clear picture of the work which it is their purpose to record. This must always appear as a missed opportunity of enlightening the public, and a few paragraphs which do no more than retail the main statistics in another form, and record minor structural changes and formal acknowledgments, can hardly be said to do justice to the vast amount of patient and careful work performed by the staff of such institutions.

Much of the important information in these publications is to be found in the reports of the Commissioners, who may express gratification at notably successful features of the hospital, or indicate directions in which some change is desirable. In three of these reports (the exception being West Humberstone) such recommendations are comparatively numerous, and are of a similar nature in each. The patients' diet (which usually costs about 5s. per head per week) is accused of monotony: a breakfast of bread and margarine and tea is the meal to which this comment is chiefly directed. In one case the women received this diet, whereas the men were given porridge and milk. The clothing, particularly of the women, requires improvement; it is pointed out that if patients had more reason to take some pride in their appearance, the effect, both on the clothing itself and on the wearers' well-being, would be far from negligible. In one case it appeared necessary that more tooth-brushes should be provided, and that care should be taken to mark and preserve them for individual patients. Another matter upon which comment is made is the degree of patients' freedom. The doors into the airing-grounds should be left open for longer daily periods; windows so constructed that to open them widely is impossible give an unnecessary sense of confinement; more patients should be allowed liberty in the grounds and outside them; more should be allowed out on trial, and such patients should receive a money allowance to enable them, if possible, to make a new start in life. Other suggestions are that letter-boxes should be provided in each ward, the key being kept by a medical officer, and that more cards and other games should be available. In two of the hospitals no dentist attended regularly. At Worcester, the post of third assistant medical officer has been vacant for some months, and a Commissioner expresses surprise that no married quarters are available for any medical officer other than the superintendent. The committee are considering the desirability of providing such married quarters, of improving the water-supply (to which two deaths from paratyphoid are attributed), and of reconstructing part of the male side to permit of proper accommodation for recent and recoverable cases. At West Humberstone a dentist has been appointed and an X ray plant installed. An additional medical officer is to be appointed whose time will be devoted chiefly to pathological work. Further innovations are the keeping of case-sheets in the wards themselves, and the provision of rooms where interviews or psychotherapy can be undertaken in private.

These improvements and defects are worthy of comment, in that many of them are engaging the attention of mental hospital committees throughout the country. It is foolish to deny that such defects are common to a large proportion of county and borough mental hospitals, and on the other hand, it is worthy of record that some are being remedied. The difficulty which in every case stands in the way of improvement is money. Organisation and treatment are as nearly perfect as the resources of the institutions permit, but the amenities which characterise life in a hospital for private patients, and play no small part in promoting recovery, can only be provided if the local authorities consent to an increase in expenditure. On these lay bodies rests the responsibility of "asylum reform."

SCHOOL MEDICAL SERVICE.

Dewsbury.

THE school medical officer makes some interesting observations in connexion with the nutritional condition of the school population in Dewsbury for 1922 as compared with 1921. In 1921 the percentage of children with so-called malnutrition was practically the same for all ages. In 1922 a progressive deterioration is shown as both boys and girls advance in years.

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[1] THE LANCET, 1921, ii., 1124; 1922, i., 150.

[2] The annual reports of the County and City of Worcester Mental Hospital, Powick; Cumberland and Westmorland Mental Hospital; City of Leicester Mental Hospital, West Humberstone; and Borough Mental Hospital, Middlesbrough.

> "The comparatively big difference in the 5-year old group as compared with the 8-year old group is hard to account for, but evidently during the three intervening years some cause or causes have been in operation affecting adversely the normal rate of development. Perhaps the zymotic diseases play the important rôle, as they are more liable to attack children between 5 and 10 years of age. Again, the 8-year old group was born in 1914, and the children were therefore affected by the food shortage of 1917–18."

Obviously the latter explanation ought to have affected the figures for 1921 as well as those for 1922. All school doctors and teachers have noticed the difference in the groups of children entering school each year; one year there will be a fine, healthy crop of children and the next year a poor one. Dr. C. J. Thomas in 1905 investigated very thoroughly groups of children born in different years who had attained the ages of 8 to 13. He found that children born in a year with a high child mortality rate were poorer physically and mentally than children born in a year with a low rate. The high mortality rate may have been produced by various causes—a hot, dry, dusty summer with epidemic diarrhœa, or a year when infective disease was rife, carrying off a large number of children and weakening others. The younger the child the greater the effect of any debilitating influence on growth. Out of a total of 2504 children inspected in the routine group, 563 required actual treatment; 309 were found suffering from malnutrition, 53 from skin disease, 207 had enlarged cervical glands (non-tuberculous). Of 1434 inspected by the dentist, 1171 were referred for treatment, and 643 actually treated. Dr. O. M. Holden reports that the accommodation at the baths is inadequate for the needs of the school-children and the inhabitants of the town, and urges an increase of washing facilities.

Warwickshire.

The school population here is about 37,500, distributed between 314 schools, compared with 319 in 1921, the reduction being due to the amalgamation of departments in several schools with a view to economy of teaching staff. During the year 12,053 routine medical examinations have been made, and of these 16 per cent. were referred for treatment. At the school nurses' examinations of 15,660 children 10·3 per cent. were found with unclean heads, a slight improvement on the 14·8 per cent. found in the previous year. Dr. A. Hamilton Wood finds it very disheartening to have to record that after 14 years of medical inspection so little attention is paid by parents and teachers to the uncleanly condition of children's heads, and says that too often the question is regarded by the head teacher as a matter for the school doctor and nurse, and one in which the teacher is not concerned. He finds in those schools where the teachers take an active interest in such matters that a high standard of personal cleanliness is obtained. Ringworm incidence, although about a hundred cases less than last year, is high, amounting altogether to 435 cases; 50 of these were given X ray treatment. Following-up is undertaken entirely by whole-time health visitors in their capacity as school nurses, to which they devote one-third of their time. This scheme appears to be working well. During the year they kept under observation 10,108 cases, treatment being obtained for 8948 of these. There were 223 fewer cases of enlarged tonsils and adenoids recommended for treatment during 1922 compared with 1921, and only £18 was spent in connexion with the provision of free meals for necessitous children living in the outskirts of the city of Coventry, as against £160 for the previous year. The reason for this is not clearly set out. This report is presented in foolscap form, and is somewhat unwieldy and difficult to handle.

EPSOM COLLEGE.—Founder's Day celebrations will be held on July 30th, when Lord Muir Mackenzie will distribute the prizes.

Correspondence.

"Audi alteram partem."

THE BEST DENTAL ANÆSTHETIC FOR CHILDREN.

To the Editor of THE LANCET.

SIR,—Mr. S. F. Rose's article in your issue of June 23rd, and Dr. H. Hilliard's letter in that of July 7th, prompt me to put forward the claims of nasal nitrous oxide and oxygen as a satisfactory anæsthetic in dental operations on children. Mr. Rose says that children take gas badly; Dr. Hilliard suggests that this is because they will not stand deprivation of oxygen. Why, then, not gas and oxygen?

The disadvantages of ethyl chloride as a dental anæsthetic in children, in comparison with nasal gas and oxygen, are, to my mind, that firstly, it is probably less safe; secondly, recovery is slower and after-results more likely (important points for a busy dentist, as well as for the patient); thirdly, it is less pleasant to take (with the result that the child is more likely to dislike any subsequent administration), and fourthly, the available anæsthesia is shorter. Mr. Rose advises immediate second or third doses to complete a difficult operation. The mental anguish and fear attending such a procedure in some children is, I am sure, very great, and I consider it unjustifiable unless it is absolutely unavoidable.

Undoubtedly children are more difficult subjects for nasal gas-oxygen than are adults, but nevertheless satisfactory results can be obtained. Children almost invariably induce quietly and easily without any contact between nose-piece and face being necessary, with the result that they usually do not mind the anæsthetic. Continued administration is the more difficult part, with a child's active reflexes, but, nevertheless, with experience, more satisfactory results than with ethyl chloride, as regards length of operation time and quick recovery, can almost always be obtained.

In unruly children, in whom cavity preparation is difficult, nasal gas-oxygen is a method offering a chance of completing work otherwise almost impossible. I can recall the case of a boy of 6 or 7, otherwise almost unapproachable dentally, in which three cavities were prepared and temporarily filled during an anæsthesia of about 20 minutes.

I never give ethyl chloride for dental work unless there be most unusual circumstances demanding it. I have only given it, in dentistry, once in the last three years, and then because the child was so spoilt and unruly that it was the only method in which he could not smash the apparatus. Such cases are rare.

I am, Sir, yours faithfully,

Harley-street, W., July 10th, 1923. STEPHEN COFFIN.

L'AFFAIRE SPAHLINGER.

To the Editor of THE LANCET.

SIR,—In writing to give you my personal opinion of the Spahlinger treatment, I cannot do better than quote the following case of my own:—

A man, aged 32, suffering from tuberculosis of the left kidney, the right kidney being sound (diagnosis by cystoscopy and ureteral catheterisation), and from non-fistulous right tuberculous epididymitis, had left nephrectomy performed on Oct. 30th, 1919, with no untoward after-effect. In May, 1920, began almost constant hæmaturia, with exaggeration of vesical symptoms. In the following July occurred left epididymitis, which opened rapidly by means of two fistulas. The right epididymitis increased, but did not become fistulous. I saw the patient again in August, when hæmaturia was still almost continuous. Having ascertained by means of the cystoscope that the latter was due to the remaining kidney, I decided that the tuberculosis must be localised on that side, and determined, in view of the gravity of the case, to try the Spahlinger treatment. From August 20th to Oct. 27th I gave several injections of serum (B.M.). There was a violent febrile reaction (max. 39·6°–40·2° C.), and painful reactions took place in the left testicle and in the operation wound, with increased hæmaturia, at the beginning of September. The hæmaturia ceased on Sept. 6th, and up to the present (July, 1923) has not reappeared. During the injections there was much suppuration from the fistulas in the left epididymis.

From the date of the last injection, Oct. 27th, the patient's general condition gradually improved. He was a mechanic, and in the spring of 1920 his bad health had forced him to give up his work; he is now working full time, with good general health, good colour, &c. His urine is opalescent with phosphates and muco-purulent débris; micturition is painless and takes place once nightly. The right epididymis is painless, rounded in shape, and the size of a nut; the nodular left epididymis is adherent to the skin of the scrotum at the level of the two dried-up fistulas.

It seems to me impossible to deny the good effect of the treatment in this case. The least that can be claimed is a distinct modification of the clinical course, and, of course, of the tuberculous lesion in the second kidney, which at the time of the nephrectomy was healthy. The patient was doubtless unfit to resist the second attack of the disease, and his general condition was rapidly growing worse. Since treatment, and in spite of resuming work, the evolution of the lesions appears arrested in both kidney and epididymis, and his general condition is that of a healthy man.

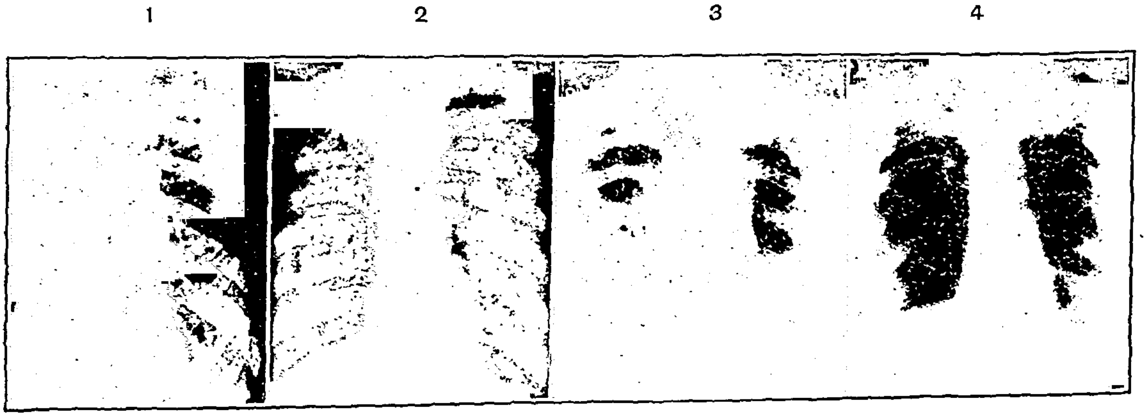
I am, Sir, yours faithfully,

Charles Perrier,
Privat-docent, Chirurgien-Adjoint à l'Hôpital Cantonal, Geneva.

July 3rd, 1923.

To the Editor of The Lancet.

Sir,—I have had the privilege for the last eight years of having treated a number of cases with Mr. Spahlinger's partial sera and with his vaccines. Although I have never used the "complete" serum, I rapidly came to the conclusion that Spahlinger's partial sera produce most favourable results in the treatment of acute or severe tuberculosis, results which no other hitherto known treatment could give. A series of cases, mostly in an advanced and rapidly progressing stage of the disease when they came under my care, were treated with these antitoxins and are alive to-day, and engaged in their normal work. I quote four typical interesting cases :—



Radiograms: 1. Case 3 when marked improvement had taken place. 2. Case 3 after recovery. 3. *Case 4 when partial serum treatment was commenced.* 4. Case 4. Radiogram taken one year after.

Case 1.—F. L., male, aged 25. Patient had coxalgia at 9 years of age. Treated by extension and sea-baths, as a result of which condition improved. There remained, however, a permanent focus in the track of the fistulous opening. Up to the moment when Spahlinger's treatment was commenced, the patient had continual relapses, which necessitated frequent medical and surgical intervention. Three operations took place; the last one, which was of an urgent nature, was performed in 1915. It necessitated making an incision of about 8 inches and inserting four drainage-tubes. In order to dry up the suppurating lesion and to avoid abscess formation, which occurred after each preceding operation, patient was in 1915 treated with Spahlinger's vaccine. Cicatrisation of the wound rapidly took place and the suppuration disappeared. Treatment was continued for eight months with one interruption of a few weeks.

Examination in June, 1923, shows complete arrest of the *disease. It is interesting to note that before Spahlinger's* treatment was commenced, abscesses formed periodically, necessitating continual care and preventing patient effecting a complete recovery. Since receiving the course of vaccine in 1915, patient has had no relapse whatever and for seven years has now been able to lead a normal life.

Case 2.—G. V., male, aged 30. Four years ago patient had a severe hæmorrhage. Early in 1913, while working at Algiers, he suffered from violent cough, repeated attacks of hæmoptysis, weakness, breathlessness. Pulmonary tuberculosis was diagnosed. He received hospital treatment at Algiers with ensuing improvement. From March until August, 1914, condition became slowly worse. Sent back to France. When patient came under my care in July, 1915, his chest examination showed extensive bilateral fibro-caseous infiltration with softening well marked at apices. His cough was troublesome, the daily expectoration amounted to 8 oz., and T.B. were present in large numbers. Slight rise of evening temperature. Frequent hæmorrhages. Loss of weight 8 lb. *during the last six months* (normal weight unknown). Night sweats. Dyspnœa very troublesome. No appetite. Anæmia. Fainted on slightest exertion.

After a 12 months' course of Spahlinger's *serum* and vaccine the signs in chest had completely dried up, and general condition had much improved, when patient had a sudden attack of hemiplegia, with a positive Wassermann. He died the week following from a syphilitic gummata in the brain. His post-mortem revealed extensive scar tissue throughout both lungs.

Case 3.—H. N., male, aged 23. Patient contracted bronchitis in 1913. Cough ever since. In July, 1914, had hæmorrhage. In November, 1914, sputum examination showed T.B.+ and pulmonary tuberculosis was diagnosed. He had a course of tuberculine injections at the beginning of 1915. Hæmorrhages in March and April. When patient commenced Spahlinger's serum treatment in May his chest examination showed infiltration of right upper and middle lobes and also at left apex. He complained of cough, profuse *expectoration, often* blood-stained, T.B.+, loss of weight, night sweats, temperature 101·1°F., pulse 110, dyspnœa, indigestion, diarrhœa, vomiting.

By July marked improvement had taken place, and treatment was stopped temporarily for want of antitoxins. In August new increase of activity, severe and prolonged attack of hæmorrhages. In November condition had become very critical, and a fatal termination appeared imminent. Temperature, 101·2–102·4°; pulse, 120; cough extremely troublesome; expectoration purulent, amounting to 9 oz. daily, numerous T.B. present, extreme emaciation, profuse night sweats, much dyspnœa, diarrhœa. Condition of collapse. Examination showed massive disease of the whole of right lung and scattered infiltration on left side. Serum treatment was resumed and antitoxins given in large doses. By end of December a slight but marked improvement had taken place. Patient could eat a little food and hæmorrhages had stopped, but he was still too ill to sit up in bed for thorough auscultation. End of February, 1916, he was allowed to get up. Temperature was then normal. Condition improved rapidly. In December, 1916, the disease was completely arrested, nevertheless serum treatment was continued until end of 1917. Examination in 1923 shows that there is no trace of active tuberculosis in the chest. Patient has no cough and no sputum. His weight is normal (41 lb. increase since December, 1915). There is still some dyspnœa present. He has been at work as a journeyman tailor since 1917 up to the present day.

CASE 4.—S. Y., woman, aged 42. Tuberculosis in family history. Three sisters, one brother, and husband died of pulmonary tuberculosis, and her only child died of tuberculous meningitis. Patient contracted pleurisy and pneumonia in 1916. Went to sanatorium. In November, 1917, T.B. were found in sputum. Hæmorrhages in June, 1919. Returned to sanatorium. In January, 1920, went to Leysin and in October to Davos, where she was diagnosed as a cavernous form with marked process of caseation; she remained there until March, 1921, gradually getting worse. When patient came under my care in April, 1921, chest examination showed considerable caseous infiltration at R. upper lobe and infiltration at lower lobe. Rapidly spreading disease at L. side with caseous infiltration of two-thirds of L. upper lobe and also infiltration at base of lower lobe. Active softening at both apices. Her cough was troublesome. The yellowish, purulent expectoration amounted to 5–6 oz. daily, with numerous T.B. present in it. Pulse 90–110. Loss of weight 1 st. 5 lb. Hæmoptysis. Much dyspnœa.

After two years of Spahlinger's partial serum treatment the disease is now (June, 1923) completely arrested. Temperature, pulse, and weight normal. There is a little cough and phlegm in the morning, but since the beginning of 1923 the sputum examination has always remained negative. Patient is very well and leads a normal life. She is still receiving partial serum injections once a week.

Some of the cases are still receiving once or twice a week an injection of partial serum, while awaiting a course of active immunisation which, unfortunately, is unavailable at present. On the other hand, the 11 patients I treated with Spahlinger's vaccine in 1915–16 have made a lasting recovery and have had no treatment whatever since their discharge. Two of these patients were suffering from tuberculosis of the bones, duly confirmed by bacteriological tests, and nine were pulmonary cases, with T.B. present in each sputum examination. Unfortunately three of them died subsequently from diseases other than tuberculosis. The remaining cases have been in perfect health for the last seven years. They are able to lead a normal life, engaged in active work, and on no occasion have they shown any signs of relapse.

I am, Sir, yours faithfully,

Geneva, July 3rd, 1923. DR. E. TRECHSEL.

MENTAL HOSPITALS SERVICE.

To the Editor of THE LANCET.

SIR,—In your review of various mental hospital reports under the above title in THE LANCET of July 14th reference is made to The Retreat and to Barnwood House, Gloucester, under the heading "Two Private Mental Hospitals." The two hospitals mentioned are in reality "registered hospitals"—that is to say, establishments managed by a voluntary committee, none of whom have any pecuniary interest in it. In this respect they are thus precisely on the same footing as the Scottish Royal Asylums. As the phrase "Private Mental Hospital" properly refers, not merely to institutions for private patients, but to those which are managed for the profit of some person or company, I think it worth while to draw your attention to the inaccuracy.

I am, Sir, yours faithfully,

HENRY YELLOWLEES.

Laurel Beeches, York, July 17th, 1923.

*** The heading was not intended to convey more than that the two hospitals mentioned were for private patients.—ED. L.

THE LINGUAL TONSIL IN RELATION TO THE SINGING VOICE.

To the Editor of THE LANCET.

SIR,—In the condensed report of the discussion on Mr. Seymour Jones's interesting paper on the Lingual Tonsil in THE LANCET of June 23rd, p. 1265, some speakers suggested that too much importance might be attributed to it. There is, however, one of its aspects—namely, the effect of its enlargement on the singing voice—which I think is of considerable importance. Briefly, this condition interferes with the elevation of the epiglottis, which accompanies, and is probably essential to, the clear production of the higher notes. Removal of sufficient of the redundant portion to relieve the pressure on the epiglottis has been followed by increased comfort in singing, and by the gain or recovery of several notes. The point receives consideration in my lecture[1] on "Some Disturbances of the Singing Voice."

I am, Sir, yours faithfully,

London, July 14th, 1923. JAMES DUNDAS-GRANT.

THE RÔLE OF THE TOOTH-BRUSH.

To the Editor of THE LANCET.

SIR,—The letter of Sir John O'Conor, published in THE LANCET of June 2nd, has been read with interest, but also with great surprise. It is certainly most astonishing to find any one willing to make such sweeping statements that the daily use of a bristle tooth-brush is harmful, and at the same time offer nothing to corroborate his views. The fact that the gentleman states that dental caries and pyorrhœa come from the use of the tooth-brush shows the lack of careful investigation on his part. The correct brushing of the teeth and gums not only removes food debris, but strengthens and hardens the gums and stimulates the blood-supply to the teeth.

Had Sir John O'Conor stated that the ailments he enumerates are largely due to the use of foods which do not need mastication he would have more closely approached the truth. Hard and dry foods requiring mastication and insalivation will give the necessary exercise to dental organs and bring into proper play those functions which will keep the teeth and adjacent tissues in normal, healthy condition. Cooked foods, tinned foods, sloppy foods, bread made of wheat, from which all the most important elements have been removed, oatmeal drowned in milk and smothered with sugar, jams, sweets, mashed potatoes, and juicy tender flesh which dissolves and does not need much effort to masticate, these are far more productive of pyorrhœa and dental caries, gastric pollution, and appendicitis than are all the tooth-brushes ever made since time began. In the conditions and environments that men live to-day, the tooth-brush is a necessity for the maintenance of mouth hygiene. In the United States we are collecting a vast amount of valuable data showing the importance and value of using the tooth-brush three and four times a day.

The oral hygiene movement has taken a firm hold in our country and there are signs that the people of England are taking up this subject with zeal and thoroughness. In the city of Bridgeport, where the daily use of the tooth-brush has been taught in every public school for the past five years, and where every school child has a tooth-brush, a large reduction of children's illnesses has already been recorded. A large reduction of dental caries and a 50 per cent. reduction in backward children has also been secured. During the past eight years over 50,000 cleansing operations have been given to the employees of the Metropolitan-Life Insurance Company. Instructions are also given for the proper use of the tooth-brush. In all these years and for all these thousands of persons there has not been one case of pyorrhœa, dental caries, gastric pollution, appendicitis, or organism decomposition that has been traced to the daily use of the tooth-brush. Nay, further, it can be shown that the improvement in general health has been so marked, that whereas, during the first four years it was optional with the employees to have their teeth cleansed, now it is a rule of the company that every one of its seven thousand employees must have two cleansings each year. Dr. Geis and Dr. Kleiger of Columbia University found that one milligramme of tooth scrapings in an uncared for mouth contained from five to eight hundred million bacteria by count and weight, whereas, in one milligramme of tooth scrapings in a fairly clean mouth there were approximately only five million. It can be safely stated that the bacteria found in a clean mouth are to all intent and purpose practically harmless, whereas those that are found in a dirty mouth become virulent and dangerous. Another factor is the question of the health of the soft tissues of the mouth. When the soft tissues of the mouth are in a normal condition, they are practically impervious to bacterial life, but when the gums become inflamed, they then become open gateways for the entrance of disease germs into the circulatory system of the body.

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[1] Clinical Journal, 1913, xlii., 504–5.

Nothing will bring about more quickly an inflamed condition of the soft tissues surrounding the teeth than the lack of proper and sufficient mastication upon hard foods and the presence of decaying particles left from mushy meals. The formation of calcium deposits also causes inflammation of the gums. By the proper use of the bristle tooth-brush and tooth-powder and rinsing the mouth with lime-water after cleansing will do more for the hardening and strengthening of the gums, the prevention of pyorrhœa, and dental caries than any other known remedy. I have yet to see a patient who uses a badger-hair tooth-brush who did not have a mouth reeking with food debris a week old, and with inflamed gums and pus discharge. Until the food habits of the entire civilised world are changed, bristle tooth-brushes are a necessity for the maintenance of mouth hygiene.

I am, Sir, yours faithfully,
THADDEUS P. HYATT, D.D.S., F.A.C.D.

New York City, July 5th, 1923.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Rear-Admiral J. Shand will be succeeded by Surg. Rear-Admiral J. F. Hall in charge of the Royal Hospital, Malta.

Surg. Vice-Admiral Sir R. Hill, Director-General of the Medical Department of the Navy, to be Honorary Surgeon to His Majesty, vice Inspector-General of Hospitals and Fleets W. H. Lloyd, deceased.

Surg. Rear-Admiral G. A. Dreaper is placed on the Retd. List.

Surg.-Capt. A. Gaskell to be Surgeon Rear-Admiral.

D. H. Kernohan is entered as Surg. Lieut. for short service.

ROYAL ARMY MEDICAL CORPS.

Temp. Hon. Lt.-Col. T. E. K. Stansfield relinquishes his commn. and retains the hon. rank of Lt.-Col.

Lt.-Col. A. F. Carlyon, late R.A.M.C., half pay, retires on account of ill-health contracted on active service.

The undermentioned retire on ret. pay: Lt.-Col. G. H. Goddard on account of ill-health; Maj. R. J. C. Thompson on account of ill-health contracted on active service (and is granted the rank of Lt.-Col).

Capt. R. W. Galloway relinquishes the temp. rank of Maj.

Temp. Capt. F. J. P. Daly relinquishes his commn. and retains the rank of Capt.

ARMY DENTAL CORPS.

Lt. N. H. Medhurst to be Capt.

TERRITORIAL ARMY.

Maj. J. V. Bates (late R.A.M.C.) to be Capt., and relinquishes the rank of Maj.

Lt. J. W. Macfarlane to be Capt.

Lts. J. R. Oddie (from 5th Bn. West Yorkshire Regt.) and A. Badenoch (late R.G.A., T.F.) to be Lts.

TERRITORIAL ARMY RESERVE.

Lt.-Col. E. J. D. Taylor (from 5th Southern General Hospital) to be Lt.-Col.

Capt. P. E. H. Adams (from 3rd Southern General Hospital) to be Capt.

INDIAN MEDICAL SERVICE.

Lt.-Col. H. Ainsworth to be Colonel.

The King has approved the retirement of Lt.-Col. S. H. Burnett.

SIXTH CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY.

THE International Society of Surgery is holding this week, July 16th to 20th, its Sixth Triennial Congress, the first to be held in this country, at the house of the Royal Society of Medicine, at 1, Wimpole-street, under the presidency of Sir William Macewen, F.R.S.

MONDAY, JULY 16TH.

On Monday members' obtained detailed programmes for the week; only a business meeting of the international committee took place. On that evening a conversazione was held at the University of London; members of the Society and ladies were received by Mr. H. J. Waring, Vice-Chancellor of the University, and Mrs. Waring, and had opportunities of renewing old acquaintances and making new ones. The band of H.M. Scots Guards played musical selections and light refreshments were provided.

TUESDAY, JULY 17TH.

INAUGURAL SESSION.

On Tuesday, at 11 A.M., the inaugural session was opened by H.R.H. the Prince of Wales. His Royal Highness was received by Sir Wm. Hale-White, President of the Royal Society of Medicine, and signed the roll as an Honorary Fellow. He was then welcomed by the President of the Congress and presented with the Society's medal in gold. The Prince referred to the international aspect of the gathering, now for the first time meeting in Great Britain in the house of a Society of which he was an honorary member, and welcomed the delegates and members from other countries. Modern surgery was, he pointed out, the outcome of international coöperation, since it owed its inception to the work of Pasteur and Lister. A special welcome was extended to Dr. W. W. Keen, of Philadelphia, the doyen of the Congress. Lord Curzon welcomed the delegates on behalf of the Foreign Office. Such meetings, he said, while they might produce fruitful rivalry between nations, were a valuable part of the machinery of international amity. He wished he could apply surgical methods to the ills of the body-politic with the same accuracy and prospects of success. Mr. Neville Chamberlain hoped the Congress would be attended with results fruitful to mankind. Already no more useful advance had been made in any branch of science than in surgery; much progress had been achieved in the late war, notably in plastic or reconstructive surgery. Illness resulted in economic loss, and anything that tended to cure disease or shorten it deserved the gratitude of all nations. Mr. J. E. H. Roberts, the British delegate, briefly welcomed foreign delegates, and thanked them for choosing London as the venue for the Congress. The following delegates were then presented to His Royal Highness: Dr. Bruce (Canada), Dr. Zacharicky (Czecho-Slovakia), Dr. Hansen (Denmark), Dr. Petridis (Egypt), Prof. Hartmann (France), Dr. Koch (Holland), Dr. Allessandri (Italy), Dr. Nicolaysen (Norway), Dr. de Zawadski (Poland), Dr. Kayser (Sweden), Dr. de Quervain (Switzerland), and Dr. MacArthur (United States). Prof. Willems, President of the International Committee, after thanking the Prince of Wales for his presence and gracious words, pointed out that this was the first occasion upon which the President was a subject of the country where the Congress was held. A list of the members whom the Society had lost since its last Congress was read.

Dr. L. Mayer, Secretary-General, cognisant of the Prince of Wales's knowledge of that language, spoke in French, and thanked the Prince and the Ministers for their presence at the inaugural session. He referred to the lamented death of Sir Charles Ryall, whose place as organising secretary had been taken with conspicuous success by Mr. Roberts, to whom, with Sir

D'Arcy Power, the thanks of the Congress were due for the splendid organisation. The President of the Society, Sir William Macewen, delivered an address in which he suggested that much could be learnt about human anatomy from a study of animals. The growth of a stag's antlers, for instance, provided a fascinating subject which might well provide an insight into the growth of bone. In three months the stag produced a complicated pair of antlers composed of solid bone covered by a vascular "velvet." Yet these bony excrescences grew from the frontal bone which was covered by pericranium, a membrane which, even according to the orthodox view of the osteogenetic function of periosteum, had only the most meagre bone-forming powers. In a few months more the antlers underwent a process of aseptic sclerosis and death, and were finally shed, this being contrary to Metchnikoff's theory that senility of tissues was the result of bacterial invasion. Histological examination of the antlers made it possible to recognise the osteoblasts by their form, and to trace them through all the stages of growth and shedding. Sir William Macewen was sceptical of the theory that mesoblastic cells had the property of converting themselves into any other form of mesoblastic cell, and stated his belief that bone-cells were invariably developed from bone-cells, and that certain bone-cells had inherited greater osteogenetic power than others. It was well that it should be so, for otherwise bony injuries would produce serious deformities; 40 years ago he had been able to prove that bone grew from bone, by reproducing a humerus from pieces of bone removed from other human subjects.

FIRST SCIENTIFIC SESSION.

The first scientific session, held on the afternoon of Tuesday, was devoted to the surgery of the endocrine glands.

Surgery of the Thymus in Early Life.

Dr. Victor Veau (Paris) said that enlargement of the thymus, which was responsible for many deaths in infancy, was amenable to surgery. Thymectomy was an easy operation, devoid of any serious risk and curative if the diagnosis were correct. But as there must always be a little doubt about the diagnosis and as a similar result could be obtained by one or two doses of X rays he preferred now to employ radiotherapy rather than surgery. The X rays were not altogether devoid of risk; should this risk prove to be serious he would revert to surgery.

The Splenic Syndromes.

Dr. W. J. Mayo said that the spleen was chiefly a mechanical filter, which removed degenerated red cells and toxic agents from the blood. It sent them on to the liver for further detoxication; it also developed lymphocytes. The function of the normal spleen was not important, but the diseased spleen was a serious menace to the constituents of the blood and to the liver. The spleen did not initiate the pathologic processes with which it was concerned, but acted as a secondary agent. The removal of the spleen in the splenomegalies and in certain blood conditions removed a pathologic agent. A spleen that was chronically enlarged and did not yield to reasonable medical treatment should be removed early, unless in the individual case there were contraindications to splenectomy.

Two hundred and ninety-five splenectomies had been performed at the Mayo Clinic, and all the deaths were classified as being due to the operation.

Splenomegalies due to Micro-organisms.

Cause.	No. of splenectomies.	Deaths.	Results.
Chronic syphilis	8	1	Good in 7 cases.
Tuberculosis	4	1	„ 3 „
Pyogenic organisms ..	11	4	„ 6 „
Splenic anæmia	82	9	„ majority.

Hæmolytic Icterus.—Forty-two splenectomies were performed for this condition, one died in hospital, and 40 recovered perfectly.

Pernicious Anæmia accounted for 57 splenectomies; there were three deaths in hospital, but no deaths amongst the last 40 patients prepared by blood transfusion, and the improvement in all was more prolonged than in that following blood transfusion alone; there were no cures, but the abnormal blood picture improved. He thought splenectomy in cases of pernicious anæmia was only justified in a limited number of carefully selected cases.

Polycythæmia Rubra Vera.—One splenectomy was performed for this condition. There was great improvement. The patient was able to work.

Hæmorrhagic Purpura (essential thrombohæmia).—One splenectomy was performed with good result.

Splenomyelogenous Leukæmia.—Twenty-nine splenectomies were done for this disease with only one death in hospital, and great temporary benefit in 28. The condition of the blood was improved, but was not normal. The other 59 miscellaneous cases were not discussed in this paper.

Some Points in the Surgery of the Suprarenals.

Drs. Ch. Willems (Liége) and N. Goormagtigh (Gand) said: In classifying suprarenal tumours, the morphological, functional, and embryonic distinction between the cortex and the medulla was most important. The "cortico-surrénalomes" were the most frequent, while the tumours of the medulla were most rare and belonged to two groups—those of nervous origin, and those of chromaffin origin.

The syndrome of Sargent-Bernard presented an acute form corresponding to the destruction of the glands, and a less serious form which probably corresponded to partial lesions. This was, however, controversial. The former had the appearance of an intoxication, while the latter form presented as principal symptoms hypotension and asthenia. The excision of one of the healthy suprarenals, with the idea of lessening the amount of suprarenal substance, had been performed, especially for epileptic fits. The results obtained were interesting, but the problem was far from solved. The removal of the suprarenal had also been performed in cases of hypertension, so as to reduce the suprarenal functions. Of the two ways which had been used for the extirpation of the healthy suprarenal, the transperitoneal one was not the handiest in spite of its appearance. The retroperitoneal way, according to the technique of the authors, was more advisable, being more accurate and giving the required view.

Pituitary Surgery.

Mr. Percy Sargent (London) said that considerable progress in pituitary surgery had been made since Victor Horsley's pioneer operations of more than 20 years ago, but there was still much to be learnt. Operation might be directed to (*a*) influencing the secretory output, (*b*) relieving local pressure symptoms, (*c*) relieving general intracranial pressure. Total removal of a pituitary tumour was impracticable, but partial removal might be of great benefit. In some cases a simple decompression operation was all that could be done, and might be very beneficial, even as regards vision. The causes of failure, in the speaker's opinion, were: (i.) errors of diagnosis leading to misdirected operations; (ii.) massive intracranial extension of the tumour, rendering the case unsuitable for any operation except a palliative decompression; (iii.) operative accident; (iv.) post-operative pneumonia; (v.) in trans-sphenoidal operations, septic infection.

The osteoplastic frontal approach was the procedure chosen in most cases; the trans-sphenoidal operation, although presenting certain advantages, was incapable of affording more than partial and transient relief. Advance in pituitary surgery must come about through improved diagnosis, wiser selection of cases, and earlier operations.

Surgery of the Thymus.

Dr. Lorthior (Brussels), after a brief reference to the possible function of the thymus gland, went on to discuss the indications for its removal, the chief of which was thymic asthma; there were other indications, such as laryngismus stridulus, respiratory embarrassment leading to debility and arrested mental development, intolerance of anæsthetics, &c., and their number was increasing. After removal of the thymus there was often a striking improvement in the general condition of the child, in its intelligence, vitality and rate of growth, resembling the effect of removal of adenoids. The operation was conducted as follows. After being anæsthetised (the reporter's preference was for chloroform, although other general anæsthetics, ether, nitrous oxide, &c., could be employed) the child was placed in Rose's position and a small incision about one inch in length was made vertically upwards from the suprasternal notch. The muscles having been separated, the thymus in its capsule was seized with forceps when it appeared from behind the sternum during expiration; the capsule was opened and the gland substance proper seized with forceps. From this moment the hold upon the gland by forceps must not be released until the gland had been removed by gentle and patient traction. As each succeeding portion appeared it was grasped with fine Kocher's forceps which provided a fresh hold for further enucleation until the whole or almost the whole gland came away. There was never any appreciable hæmorrhage, the vessels being very small; only very occasionally it was necessary to crush a vessel of unusual size and ligature of vessels was never called for. The operation was completed by closing the skin wound with a few Michel's clips. The mortality of this operation had, up to the present, been nil; it was easily performed and the results had been most gratifying.

DISCUSSION.

Mr. H. Henry (Dublin), who had found that the difficulty in Cushing's nasal approach to the pituitary gland arose chiefly from the variations in the sphenoidal sinus, exhibited an instrument by which he had been able to overcome these difficulties. The instrument consisted essentially of a metal tube attached variably to an apparatus which gave a firm attachment to the hard palate. The tube was passed into the submucous resection wound and guided into position by observations with the X rays, the operation being conducted in the X ray room. When in position the pituitary could be attacked under direct vision by means of instruments similar to those used with the operating cystoscope.

Testicular Grafting.

Dr. Serge Voronoff (Paris) described the objects and technique of testicular grafting which he had now performed in 44 cases in the human subject. After much experiment he had now devised a method which ensured long survival of grafts of fresh chimpanzee testicle into the human tunica vaginalis testis. The results of this method employed since 1920 had been both marked and, up to the present, permanent. The phenomena observed were a lowered blood pressure, reduction of weight in obese subjects, better vision in hypermetropes as the result of improved elasticity of the lens, new growth of hair, and improved muscular power and mental activity. To obtain such results it was necessary to use the testicles of monkeys of full growth and unmistakable virility; where the testes of young monkeys, in whom the internal secretion was not developed, were used no benefit had accrued. This proved that the results were not born of auto-suggestion. He appealed to other surgeons to try the operation when he was convinced they would realise its value.

Mr. Ivor Back (London) had seen Dr. Voronoff's work at Paris and talked with his patients, most of whom were themselves medical men, and was convinced of the value of testicular grafting. The effects of the removal of the testicular secretion by castration were well-known and the restoration of the internal secretion of the testes could, and did, restore many of the functions which decayed with age. The difficulty had been to find a suitable place where the grafts would survive. If placed under the skin or in the peritoneum they were absorbed, but with Dr. Voronoff's present method of implanting the grafts into the scarified tunica vaginalis, where each was anchored by a suture, they survived long enough to obtain a blood-supply; histological proof of this survival was obtained. The chimpanzee was selected as the donor on account of its close relationship to man; the excised testicle was cut into six segments and three were implanted into the interior of the tunica vaginalis of each testicle of the recipients. It was found that grafts of this size became vascularised in about 48 hours and survived. If smaller grafts were used they were absorbed and if larger they were apt to undergo necrosis at least in part.

Thyroid Transplantation.

Dr. A. Kocher (Berne), who had performed thyroid transplantation in 214 cases with only 14 per cent. of failures, described the operation as suitable, in the words of his late father, Prof. Th. Kocher, "for slight cases of thyroid deficiency," and preferable to thyroid medication. The most refractory cases were those of congenital absence of the thyroid, but three out of ten of such cases were improved, in one case sufficiently to take a university degree. The method employed was to implant portions of human thyroid not larger than a cherry, taken preferably from the upper pole of an exophthalmic goitre, into the peritoneum, where they were fixed by suture, or into the medullary cavity of the tibia. Patients must take thyroid before and for a little while after operation or the graft would not survive, while about half the patients had to supplement with thyroid medication after the operation, although the quantity required was always much reduced.

Dr. Froell (Stockholm) described the histology of different varieties of goitre and their associated blood changes. He had found that the pH concentration was high in toxic and low in ordinary goitres.

Use of Insulin in Surgery.

Dr. F. G. Banting (Toronto) said that insulin could have no effect on diabetic gangrene, as this was the result of arterial change; the use of insulin would, however, render the subject sugar-free, and permit of operation for gangrene or for any acute condition, such as appendicitis in a diabetic subject.

Suprarenal Grafting.

Mr. F. C. Pybus (Newcastle-upon-Tyne) described a successful case of suprarenal grafting for Addison's disease. The patient, who had previously been discharged from hospital as incurable and on the point of death, made a striking recovery after having suprarenal (from a healthy adult who died of an accident) grafted into the subcutaneous tissues. The blood pressure rose, pigmentation disappeared, muscular power was restored, and the blood picture, which had previously been that of pernicious anæmia, returned to normal. The man was able to return to light work for three years, when the symptoms recurred, and a fresh grafting was performed; no traces of the original graft could be found at the second operation. A second case in which a suprarenal graft from a male was implanted into a female was unsuccessful, as were also two attempts to graft pancreas into the subjects of pancreatic diabetes, though in one of the latter cases there was a slight and transient lessening of the glycosuria.

Dr. Juracz (Posen) described the effect of stimulating doses of X rays on the suprarenals in a severe case of asthma. The patient, though not cured, was much relieved, and one attack was cut short by the use of the X rays. Attempts to benefit cases of exophthalmic goitre by destructive doses of X rays directed to the suprarenals had also been made, but with less success.

Pituitary Tumours.

Dr. Krinski (Warsaw) described his experience with these tumours, and Mr. A. J. WALTON (London) advocated the frontal approach as the only one by which reasonably good access could be obtained.

The nasal route gave insufficient access to tumours that were generally more intracranial than sella, and carried a risk of sepsis. If approached by Horsley's temporal route the operation was embarrassed by a number of cranial nerves and the internal carotid artery, whereas the frontal route gave excellent exposure when the tumour protruded (as it almost invariably did) in front of the optic chiasma. By this route he had removed pituitary tumours, he believed completely, in seven cases with three deaths following operation and one remote death. The remaining three cases were strikingly improved.

In the evening a reception was held by Sir William and Lady Macewen at the Royal Society of Medicine, in the course of which the President gave a popular lecture on the Growth of Bone.

(To be continued.)

Medical News.

UNIVERSITY OF LONDON: *King's College Hospital Medical School.*—The following awards have been made:—

Burney Yeo Scholarships: G. F. Taylor, Sidney Sussex Coll., Cambridge; M. E. Lampard, Corpus Christi Coll., Cambridge; J. W. Thornton, Magdalen Coll., Oxford; J. A. Eyres, Lincoln Coll., Oxford. Epsom College Scholarship: R. P. Ross, Gonville and Caius Coll., Cambridge. Senior Scholarship and Tanner Prize for Obstetric Medicine: W. P. H. Sheldon. Jelf Medal: F. Brockington. Todd Prize and Medal for Clinical Medicine: F. Brockington. Class Prizes: *Diseases of Children* and Orthopædic Surgery, W. P. H. Sheldon; Medicine, R. Cove-Smith; Surgery, H. C. Edwards; Obstetric Medicine, F. Brockington; Pathology, C. E. Newman; Forensic Medicine and Psychological Medicine, M. A. Paul; Hygiene, L. H Savin.

University College.—The following awards in the Faculty of Medical Sciences have been made: Bucknill Scholarship (1922), R. L. Midgley; Medical Entrance Exhibitions (1922), E. H. Madge and V. Freeman; Sharpey Scholarship, A. S. Parkes; Cluff Prize, G. F. H. McCormick; Schafer Prize, Dr. Katherine Coward; *Gold Medal* for Anatomy (Senior Class), G. F. H. McCormick; Silver Medal for Anatomy (Junior Class), H. Awrounin; Gold Medal for Physiology (Senior Class), G. F. H. McCormick; Silver Medal for Organic and Applied Chemistry (General Course), R. M. Sargent. Silver Medal for Pharmacology (General Course), Beatrice G. Smith.

UNIVERSITY OF OXFORD.—*Radcliffe Scholarship in Pharmacology.*—This scholarship has been awarded to Robert Benedict Bourdillon, sometime Fellow of University College.

Theodore Williams Scholarships.—The following awards have been made:—In Physiology: Ormond Alec Beadle, New College; in Human Anatomy: John Samuel Jerome, Christ Church; in Pathology: George Payling Wright, Exeter College.

Beit Fellowship.—John Maurice Hardman Campbell, New College and Magdalen College, chief clinical assistant in the Neurological Department at Guy's Hospital, has been elected by the trustees to a Beit Memorial Fellowship for Medical Research.

UNIVERSITY OF MANCHESTER: MEDICAL DEGREE DAY.—The Vice-Chancellor, Sir Henry Miers, on July 14th, in his address said that the professional training for medicine and surgery was so exacting that the medical student had little or no time for an acquaintance with research. Year after year new subjects were *added* to the curriculum, but nothing was ever taken away from it. No other degree course was so long or so expensive. *The time* available for many of the special subjects was so short that their study was necessarily somewhat perfunctory. The medical curriculum was made up of a whole series of incomplete fragments, because the general practitioner might be called upon in the course of his practice to face problems connected with any of them. The medical profession was the most responsible of all professions, and we could not afford to neglect any part of the curriculum. He thought that in future the universities might give to their old students "refresher courses" to which medical men in the district might come without too great a sacrifice of their time. The Dental Board had tried such an experiment last year in providing lectures by eminent specialists at several university centres, of which Manchester was one. There was no place in England where the opportunities of medical training were greater than they were at Manchester with a group of hospitals serving the needs of a dense population.

Degrees were granted and awards made as follows:—

M.D. EXAMINATION.

J. C. Bramwell (awarded gold medal), C. H. Broomhead, Eugenia R. A. Cooper (awarded gold medal), Georgiana M. Duthie (awarded commendation), Ruth E. C. Verney, W. H. Wood (awarded gold medal).

FINAL M.B., CH.B. EXAMINATION (OLD REGULATIONS).

Greta Lowe, Louis Magenstern, Leslie Morris, G. T. Robinson, G. B. Stenhouse, and Geoffrey Talbot.

FINAL M.B., CH.B. EXAMINATION (NEW REGULATIONS).

Arnold Brown, W. B. Bacon, *§Arthur Barlow, Bernard Bowman, §A. J. E. Cave, *‡Albert Coleman, Gordon Crompton, N. L. Edwards, W. E. Fildes, W. A. J. Fleming, ‡E. J. Foulds, ‡Allen Glenn, *‡§Marjorie A. Grant, Evelyn M. Holmes, §K. H. Jackson, A. M. Jones, H. M. Levy, Miles Parkes, Donald Ramage, *‡G. C. Sharp, Margaret Simcock, ‡Wilson Smith. §W. G. Southern, and †§L. J. Witts.

* Awarded second-class honours. † Awarded first-class honours.
‡ Distinction in Forensic Medicine.
§ Distinction in Hygiene and Preventive Medicine.

Obstetrics and Surgery.—William Broadhurst, Madge E. Heywood, Bertha Kahn, A. C. Kelly (distinction in Obstetrics), W. B. McKelvie, Gladys F. A. McLean, Marjorie M. O'Dea, R. W. Parker, W. M. Roberts, Marjorie Robinson, Kate B. Scott, Agnes Seaston, Marjorie Thompson, Sarah Walker, Jane M. Wilde, and Marjorie Youatt.

Obstetrics.—C. N. Aldred, V. F. Lambert, and Thomas Pierson.

Forensic Medicine.—Bessie E. Cook, R. W. Fairbrother, and Thomas Pierson.

Hygiene and Preventive Medicine.—C. N. Aldred, Bessie E. Cook, R. W. Fairbrother, Thomas Pierson, H. F. Shaw, and Robert Slater.

Surgery.—J. F. Bromley.

UNIVERSITY OF DURHAM.—At Convocations held recently the following degrees were conferred:—

Doctor of Medicine.—Neil R. Beattie, Douglas G. P. Bell, Thomas H. Bates, Oliver Colville, Samuel W. Davidson, Charles N. Gover, and Stanley Worthington.

Doctor of Medicine for Practitioners of Fifteen Years' Standing.—William H. Bennett, Philip H. G. Gosse, and William L. Hodge.

Master of Surgery.—Ruth Nicholson.

Bachelor of Medicine and Bachelor of Surgery.—Reginald Armstrong, Helen Austin, Monica F. Bell, William A. Brown, Katherine M. Cellan-Jones, George A. Fothergill, Irene B. M. Green, Phillis Hall, Robert E. Haswell, Gwendolen M. Hunton, Bernard R. Isaacs, Edward H. Jaques, John E. D. Miller, Louis Minski, Doris H. Motyer, Ian M. McLachlan, Francis G. Mundell, George C. Parkin, Georgena L. Philipson, Henry N. Popham, George C. E. Reffell, Leslie F. Richmond, Henry C. Rollin, William O. Rubidge, Evelyn M. Scott, Kathleen Shelton, William F. O. Taylor, Arthur Todd, Pieter J. G. de Vos, Hugh A. Wallace, Alexander J. Watson, and John C. Yeoman.

Bachelor of Hygiene.—Neil R. Beattie.

Diploma in Public Health.—Neil R. Beattie.

Licence in Dental Surgery.—Bernard Benjamin, Walter L. Fleming, George Johnson, Uel Magnus John, George J. S. Littlefield, Charles H. Miller, William Murray, George S. Page, and Bernard J. G. Phillips.

UNIVERSITY OF ABERDEEN.—The following degrees have been conferred:—

DOCTOR OF MEDICINE.

Douglas W. Berry (honours for thesis), James S. Anderson (commendation for thesis), Andrew Topping (commendation for thesis), Dorothy E. Bryant, Alexander C. Fowler, and Louise Tomory.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

With First-class Honours.—*Allan W. Downie, *Richard D. Downie, and *Alexander Lyall.

With Second-class Honours.—†Alexander G. Badenoch, William H. Harris, Charlotte S. Hendry, and †Ian W. Laing.

Ordinary Degree.—George M. Anderson, Margaret J. Anderson, James Burnett, Janet F. Burnett, Charles W. M. Cameron, Catherine J. Clark, John Clarke, Patrick G. Currid, Robert Davidson, Douglas Dean, Elizabeth A. Dunbar, Mary Esslemont, Eric C. Gordon, Murdo McKenzie Gunn, Eleanor M. Henderson, James S. Hutchison, Archibald J. Ironside, Eric J. Jolly, *Bernard W. MacDonald, Finlay* MacLean, †Florence J. Malcolm, John C. Milne, Hugh W. Mulligan, Robert G. Munro, Forbes R. Mutch, James H. Peters, Margaret J. Rennet, Ernest R. Sorley, John S. Taylor, Lily M. Watt, Francis L. Webster, Mabel Wilson, and Maude Wilson.

* Passed Final Professional Examination with much distinction.
† Passed Final Professional Examination with distinction.

DIPLOMA IN PUBLIC HEALTH.

Isobel C. Brown, Evelina I. Corbett, Thomas J. Davidson, George L. Duncan, Ethel E. M. Gray, Elizabeth G. McCurrach, Norman M. Maclennan, Alexander E. Reid, Harry E. Smith, Christina Stuart, Andrew Topping, and Alice M. Watt.

The following awards have been made:—The Struthers Medal and Prize in Anatomy, John W. Foster: "A Series of Preparations illustrating the Comparative Anatomy of the Temporo-mandibular Articulation." The Lizars Medal in Anatomy, John W. Foster, Arthur J. W. Wilkins (equal). The John Murray Medal and Scholarship (awarded to the most distinguished graduate in medicine (M.B., Ch.B.) of the year 1923), Alexander Lyall, M.A., Aberdeen.

Royal College of Surgeons of England.—A quarterly Council meeting was held on July 12th, with Sir Anthony Bowlby in the chair. The President announced that at a meeting of the Fellows on July 5th five Fellows were elected into the Council in the vacancies occasioned by the retirement in rotation of Sir Charters J. Symonds and Sir Herbert Waterhouse, by the deaths of Sir William Thorburn and Sir Charles Ryall, and by the resignation of Mr. F. F. Burghard. The result of the poll, at which 1052 Fellows voted, was as follows:—

	Votes.	Plumpers.
James Berry	612	6
George Ernest Gask	466	28
John Herbert Fisher	445	53
Percy Sargent	445	3
William Sampson Handley ..	433	8

The above were therefore elected and Mr. Handley becomes substitute member of Council for Mr. Burghard until July, 1929, and Mr. Sargent becomes substitute member of Council for Sir William Thorburn until July, 1930. Messrs. Berry, Fisher, Handley, Sargent, and Gask took their seats on the Council.—Diplomas in Public Health were granted, jointly with the Royal College of Physicians, to 19 candidates. Diplomas in Psychological Medicine were granted, jointly with the Royal College of Physicians, to eight candidates.

The following professors and lecturers were appointed for the ensuing year:—

Hunterian Professors.—Robert Lawford Knaggs: One lecture on Leontiasis Ossea and one lecture on Osteogenesis Imperfecta. William Sampson Handley: One lecture on General Peritonitis. Charles Max Page: One lecture on the Operative Treatment of Osteoarthritis. Kenneth Macfarlane Walker: One lecture on the Internal Secretion of the Testis. Alexander Fleming: One lecture on the Employment of Antiseptics in Local and General Infection. Geoffrey Jefferson: One lecture on Injuries of the Cervical Spine. Frank Cook: One lecture on Toxæmias of Pregnancy. William Edward Gallie: One lecture on an Experimental and Clinical Study of the Use of the Fibrous Tissues in the Repair of Anatomical Defects. Sidney Forsdike: One lecture on Cancer of the Cervix. Ranald Montagu Handfield-Jones: One lecture on Retro-peritoneal Cysts—their Pathology, Diagnosis and Treatment. Ralph St. Leger Brockman: One lecture on the Problem of Drainage in Acute Appendicitis. W. H. Ogilvie: One lecture on the Infections of the Upper Alimentary Tract.

Arris and Gale Lecturers.—Hugh Ernest Griffiths: One lecture on the Relation of Diseases of the Gall-bladder to the Secretion and Functions of the Stomach and Pancreas. Cecil Pembrey Grey Wakeley: One lecture on Some Actions of Radiations on Living Tissues. Victor Ewings Negus: One lecture on New Points in the Mechanism of the Larynx.

Erasmus Wilson Lecturer.—Samuel George Shattock: Six Demonstrations on Pathological Specimens in the Museum.

Arnott Demonstrator.—Sir Arthur Keith: Six Demonstrations on the Contents of the Museum.

Sir John Bland-Sutton was elected President, and Sir Berkeley Moynihan and Mr. H. J. Waring were elected Vice-Presidents for the ensuing year.

Royal Society of Arts.—The Council of the Society attended, on July 13th, at Clarence House, St. James's, when the Duke of Connaught, President of the Society, presented the Albert Medals of the Society to Sir David Bruce and Sir Ronald Ross "in recognition of the eminent services they have rendered to the Economic Development of the World by their achievements in Biological Research and the Study of Tropical Diseases."

Society for the Prevention of Venereal Disease.—At its annual meeting, held on July 13th, a resolution was unanimously carried accepting the Trevethin Report as a document supporting the six essentials of the policy of the Society—namely, that:—

1. A man who after exposure is properly and thoroughly disinfected by disinfectants of appropriate nature and strength, runs little risk of infection.
2. An intelligent man if furnished with reasonable instructions can, in favourable conditions, effectively disinfect himself.
3. The adoption of skilled disinfection (in disinfecting centres) is not to be recommended as part of any general system, for reasons of time, cost, and impracticability.
4. The instruction by medical officers of venereal disease clinics of male persons attending such clinics, in the preventive use of disinfectants, offers a useful means of educating the community.
5. There is no evidence of facts in support of the view that any system of disinfection would tend to increase the number of exposures and raise the disease rate.
6. The law should be altered so as to permit properly qualified chemists to sell ad hoc disinfectants, provided such disinfectants are sold in a form approved and with instructions for use approved by some competent authority.

In view of the unqualified acceptance of the Trevethin Report by the National Council for Combating Venereal Disease, the Society is prepared to form a joint committee with the National Council, under the chairmanship of Lord Dawson of Penn, to watch and further the policy based on the terms of the Trevethin Report.

Royal Northern Hospital, London.—The foundation-stone of the new casualty department, which constitutes the Borough of Islington war memorial, was laid by Lady Patricia Ramsay on July 12th.

Extension of Blackburn Royal Infirmary.—The complete scheme for this institution, which serves North-East Lancashire, is estimated to cost £200,000. It has been decided to begin with an extension involving an expenditure of £75,000. This extension is intended as the town's war memorial.

London Hospital Medical College.—A lecture for senior students of the hospital and post-graduates on the Treatment of Puerperal Sepsis (a new method illustrated by charts) will be given by Dr. S. Gordon Luker on Tuesday, July 24th, at 4.15 P.M., in the Anatomical Theatre of the College.

London School of Tropical Medicine.—As a result of examinations held at the end of this session the "Duncan" medal has been awarded to Dr. S. Peterson of the U.S. Navy. Those who passed the examinations with distinction include Dr. A. H. Baldwin, Dr. F. McCallum, Dr. S. Pampana, Dr. A. Salama, and 34 candidates satisfied the examiners.

Royal Sussex County Hospital.—Recent developments at this hospital at Brighton include the new building for the orthopædic department, the money for which was largely given by the British Red Cross Society; the gift by Lady George Nevill, in memory of her husband, Lord George Nevill, who at one time was a member of the board of management, of the whole of the equipment of her war-time hospital at Hove; and the establishment, thanks to Miss Poulter, of a school of massage at the hospital.

The Lunatic Asylums in Burma.—The construction of a third asylum is projected to relieve the congestion at present experienced in one of the two existing buildings in Burma. There is evidence in the report that excellent facilities are provided for the employment and entertainment of the patients. Alcohol and *Cannabis indica* appear to take a large share in the ætiology of insanity in Burma; general paralysis is comparatively rare. Many of the deaths were due to pulmonary tuberculosis. During an outbreak of plague in Rangoon all the patients in the asylum received protective inoculations. No cases of the disease occurred in the asylum.

Small-pox Precautions in Territorial Training Camps.—A statement has been issued by the Ministry of Health to the effect that, in view of the prevalence of small-pox in certain parts of the country, he has been in communication with the Army Council in regard to the precautions in connexion with the annual training camps of the Territorial Army and Officers Training Corps. No units will be sent to camp from an infected district, but units raised in a non-infected district may be sent to camp in a non-infected district. All men will be examined by an army medical officer before proceeding to camp, and during the camping period any unvaccinated men will be kept under observation.

Free State County Councils and Health Reform.—At the annual meeting last week of the general council of county councils—a consultative body in which all the county councils in the Free State participate—the report of the standing committee on health matters was adopted. The report demands a series of legislative reforms in regard to health; though a separate Ministry of Health is favoured, its immediate establishment is not pressed. It is suggested that a health council should be constituted representative of the medical and allied professions, local health authorities, insured persons, labour and other organisations concerned, and the Ministry of Education. It was considered that the minimum health unit should be the administrative county or county borough. The committee also recommended the repeal of the Medical Charities Act, the extension of medical benefit to insured persons and their dependents, and the provision of medical treatment for those unable to pay for it. They recommended the establishment of a medical service paid by the State. The committee also recommended that tuberculosis and all infectious and contagious diseases dangerous to health should be notifiable, and that the tuberculosis medical officer should be empowered compulsorily to isolate persons in cases where he considers isolation essential in the interests of public health. Other recommendations included the effective inspection of cattle in respect of bovine tuberculosis and the application of the tuberculin test to the milk-supply. It was further recommended that for every health area there should be a medical officer of health, a veterinary officer, and that there should be provision for the effective inspection of school-children. Almost all the recommendations of the Irish Public Health Council have been adopted.

Parliamentary Intelligence.

HOUSE OF COMMONS:

WEDNESDAY, JULY 11TH.

Cost of Pensions Patients.

Mr. ALBERT ALEXANDER asked the Minister of Pensions what was the average cost per day of pensions patients at hospitals which were under the direct control of the Ministry of Pensions.—Major TRYON replied: The average is 8*s.* 2½*d.* per patient.

Small-pox and Vaccination.

Mr. BECKER asked the Minister of Health how many cases of small-pox had been notified this year; how many deaths had occurred from small-pox this year; and was he satisfied that all cases notified as small-pox were small-pox, or had any cases so notified been found to be chicken-pox.—Mr. NEVILLE CHAMBERLAIN replied: The number of cases of small-pox notified this year up to June 30th is 1225. No deaths had been registered up to the end of last week as due to small-pox, but I understand that a fatal case occurred at Gloucester with an unvaccinated child on the 8th inst. As regards the last part of the question, I am advised that, in small-pox as in other infectious diseases, errors in the initial diagnosis have occurred in some cases, but the notification returns are corrected from time to time by the omission of those cases which after notification have been found to be cases of chicken-pox, and the addition of cases originally diagnosed as chicken-pox but subsequently found to be cases of small-pox.

Mr. BROAD asked the Minister of Health if he would supply particulars of the cases of small-pox and deaths from that disease in the city of Mexico during each of the last 10 years for which figures were available.—Mr. NEVILLE CHAMBERLAIN replied: I have no information as to the number of cases of small-pox in Mexico city. The following are the particulars available in my department of the number of deaths from that disease in the city during each of the years 1913–1922: 1913, 326; 1914, 259; 1915, no figures available; 1916, 246 (10 months): 1917, 479; 1918, 140; 1919, 12; 1920, 40; 1921, 429; 1922, 404 (10 months).

Lieut.-Colonel FREMANTLE asked the Minister of Health if he would consider the transference of the administration of vaccination to the general sanitary administration under the sanitary authorities.—Mr. NEVILLE CHAMBERLAIN replied: This question has been under consideration, but I could not undertake to introduce the necessary legislation during the present session.

Sir GEORGE BERRY asked the Minister of Health if he was satisfied with the manner in which the Vaccination Acts were being administered: and, if not, if he was prepared, in view of the present serious epidemic of small-pox, to take steps to enforce rigid compliance with them.—Mr. NEVILLE CHAMBERLAIN replied: The responsibility for the administration of the Vaccination Acts rests with the boards of guardians and their vaccination officers. I am not satisfied that the Acts are being properly administered in all districts, and I am considering what steps can be taken to secure improvement in this respect.

Mr. BROMFIELD asked the Minister of Health whether the organism of vaccinia had yet been isolated; and, if not, what guarantee could be given that it was present in any given sample of calf lymph issued by his department for public vaccination purposes.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the negative. As regards the second part, I am advised that the efficacy of the lymph issued from the Government lymph establishment is adjudged by the usual laboratory tests for purity and its effect as reported by public vaccinators. I may add that the Government lymph used during 1922 for 284,000 cases of primary vaccination gave a percentage success of 99·4.

Mr. LEACH asked the Minister of Health if he would supply particulars of the cases of small-pox and deaths from that disease in Rio de Janeiro during each of the last 10 years for which the figures were available.—Mr. NEVILLE CHAMBERLAIN replied: The following are the particulars required by the hon. Member:—

Year.	Cases.	Deaths.	Year.	Cases.	Deaths.
1913	625	118	1918	—*	222
1914	5192	1230	1919	—*	305
1915	826	258	1920	324†	99
1916	119	121	1921	187†	49
1917	1530	418	1922	327‡	117

* Figures not available.

† 4 weeks missing. ‡ 3 weeks missing.

Mr. BROMFIELD asked the Minister of Health whether the glycerinated calf lymph manufactured by the Government was tested on a certain number of children before being issued to the public vaccinators, with a view to ascertaining whether it was satisfactory; and, if so, whether the consent of the parents of the children was obtained before these experimental vaccinations were carried out.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the negative, and the second part, therefore, does not arise.

Brook Fever Hospital.

Sir KINGSLEY WOOD asked the Minister of Health whether the Brook fever hospital at Shooters Hill was about to be permanently closed, and whether he could state the reason for this course.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the negative. I understand that, owing to the reduction in the number of cases of infectious disease in London, further admissions to this hospital are being stopped for the present, but the hospital will be reopened as soon as it is needed.

Medical Aid Departments.

Mr. CLARRY asked the Minister of Health if he could see his way clear to framing regulations whereby a friendly society or group of societies might form medical aid departments for the purpose of supplying medicines and surgical appliances to their members.—Mr. NEVILLE CHAMBERLAIN replied: The object which the hon. Member has in view cannot be secured without amending legislation which would be of a controversial character, and which I do not see my way to introduce. I have no power to deal with the matter by way of regulations.

Dirty Milk Vans.

Sir ARTHUR CHURCHMAN asked the Minister of Health whether his attention had been called to the lack of clean and well-ventilated milk vans on certain railway lines noted in paragraphs 42 and 43 of the interim report on milk issued by the departmental committee on the distribution and prices of agricultural produce; and whether his department proposed to take any action in the matter.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. I propose to ask my right hon. friend, the Minister of Transport, to bring the recommendations of the departmental committee to the notice of the railway companies.

Panel Practitioners' Remuneration.

Sir KINGSLEY WOOD asked the Minister of Health whether, in accordance with the pledge given by his predecessor, he proposed to consult both the Consultative Council and representatives of the approved societies before any new terms as to remuneration and service were arranged with the medical men on the panel lists; whether he proposed to arrange such consultation before any offer as to remuneration was made; and when, and in what manner, he proposed any consultation should take place.—Mr. NEVILLE CHAMBERLAIN replied: As regards the first two parts of the question, I would refer the hon. Member to the answer which I gave him on April 11th. As regards the third part, the matter is now under consideration, and I am not yet in a position to make any statement.

Discharge of Private Lunacy Patients.

Mr. HAYDAY asked the Minister of Health by what authority the London County Council, through their asylum regulations, had interfered with the right guaranteed to a petitioner by Section 72 of the Lunacy Act, 1890, to direct the discharge or transfer of a private patient from a pauper asylum by exacting four weeks' payment if the patient was taken away, whereas in institutions for rich patients the provisions of Section 72 were punctiliously carried out and the patient was allowed to leave at once on the legal direction given by his petitioners; and would he see that this practice was stopped.—Mr. NEVILLE CHAMBERLAIN replied: Inquiry is being made by the Board of Control and I will communicate the result to the hon. Member.

Deaths from Tuberculosis.

Mr. MURNIN asked the Minister of Health the number of persons who died in England and Wales during the years 1921–22 from tuberculosis.—Mr. NEVILLE CHAMBERLAIN replied: The number of deaths from tuberculosis in England and Wales during the year 1921 was 42,678, and during the year 1922 42,777.

Cheese, Milk, and Cream Standards.

Mr. HURD asked the Minister of Health the result of his consultation with the Minister of Agriculture with a view to the adoption of the recommendations of the departmental committee for the imposition of a legal minimum standard of quality applicable to whole-milk cheese, cream, and milk powder.—Mr. NEVILLE CHAMBERLAIN replied: I understand that my right hon. friend is examining the situation with a view to determining whether it is practicable to give effect to the recommendations of the departmental committee in regard to whole-milk cheese and cream.

Thursday, July 12th.

Medical War Records.

Mr. **Ede** asked the Minister of Pensions what progress had been made with the preparation of the medical records of the war, what sum had been expended on these records up to June 30th, 1923; when it was anticipated that the record would be completed; and what would be the total cost of the same.—Major **Tryon** replied: I assume that the hon. Member is referring to the records of admissions to and discharges from ambulances, hospitals, or clearing stations during service. These medical records have now been sorted and indexed in one register, but as the work was commenced by the War Office and completed by the Statistical Division of my department as part of their general duties, I regret I am not in a position to state the cost without very considerable investigation.

Treatment for War Neurosis.

Mr. **Robert Richardson** asked the Minister of Pensions what was the total number of pensioners receiving treatment for war neurosis and other shell-shock conditions, and whether he was satisfied with the provision made in the different regions for the treatment of pensioners suffering from shell-shock and/or neurasthenia.—Major **Tryon** replied: The number of patients at present receiving treatment under my department for war neurosis is about 6900. The whole question of the treatment of this very difficult condition is kept constantly under review by my medical advisers. Full provision is made for the most modern treatment. I am glad to say that our accommodation is ample and we have no waiting list.

Final Pension Appeals in 1921.

Mr. **Whiteley** asked the Minister of Pensions what number of cases were dealt with before the final tribunals in 1921 and 1922 for entitlement and assessment, respectively, and the number of successful cases in each year.—Major **Tryon** replied: The number of appeals on entitlement decided by the tribunal during 1921 was 43,750, of which 11,500 were allowed. The comparative figures for 1922 are 37,350 and 9,980. The assessment tribunals, which did not commence work until June, 1922, decided 13,023 appeals up to the end of that year. Of these the assessment was increased in 2500 cases and lowered in 23. The final award was set aside in 2500 cases and the appeal disallowed in 8000 cases.

Institutional Treatment of Tuberculosis.

Mr. **Trevelyan Thomson** asked the Minister of Health whether he approved of the charge made to tuberculous persons in the London area in respect of institutional treatment; and, if so, why, in this respect, had the institutional treatment of tuberculous persons been differentiated from that of the other infectious diseases.—Lord E. **Percy** replied: My department have approved generally of the arrangement made by the L.C.C. for the assessment of contributions payable by tuberculous persons towards the cost of institutional treatment provided by the Council. As regards the second part of the question, the statutes under which institutional treatment is provided in London for persons suffering from other infectious diseases do not authorise the recovery of any part of the cost of treatment from the patient.

Wounds on Executed Prisoner.

Mr. **Lansbury** asked the Secretary of State for the Home Department whether his attention had been called to the fact that at the inquest held on Roland Duck, after his execution at Pentonville prison last week, a severe wound was found on his head and a considerable quantity of congealed blood was attached to his hair; whether the coroner had made a report to him as to how this injury was sustained; and whether the man's father and mother, who attended the inquest, had asked the Home Office to order an inquiry as to the cause of this injury.—Mr. **Bridgeman** replied: Reports received from the prison showed that when the body was taken down there was no mark on the head, but when the body was being washed, after removal to the mortuary and post-mortem examination of the neck by the medical officer, a bruise was noticed on the forehead. The body had slipped while being placed on the mortuary table and the head had struck a slab. The medical officer called the coroner's attention to the bruise. The coroner's inquisition was sent to me. He made no report, but I have now seen his notes, which show that the jury was satisfied that the bruise was caused after the execution. Before the inquest ended the father said he was satisfied, but both parents have written since expressing dissatisfaction. They will be informed that I find no ground for further inquiry.

Infection in Public Libraries.

Colonel **Morden** asked the Minister of Health whether his attention had been directed to the danger of infection to the frequenters of public libraries through the use of books previously handled by persons suffering from infectious ailments; and whether he would take steps to investigate this menace to the public health by directing local authorities to use adequate disinfectants in the public libraries of this country.—Lord E. **Percy** replied: The answer to the first part of the question is in the affirmative, but my right hon. friend is advised that medical officers of health are fully alive to whatever danger of infection there may be from this source. Special provisions as to the precautions to be taken to prevent the spread of infection through the use of library books are contained in Section 59 of the Public Health Acts Amendment Act, 1907, and that section may be put in force in any district on the application of the local authority. In the circumstances the Minister does not consider it necessary to undertake any special investigation or to issue any special instructions to local authorities on this matter.

Fifty per Cent. Pension Awards.

Mr. **Herriotts** asked the Minister of Pensions the number of pensioners in receipt of a pension of 50 per cent. or over on March 31st, 1919, and the number of pensioners in receipt of a pension of 50 per cent. or over on March 31st, 1923, for loss of vision, for loss of limbs, for loss of hearing, for gunshot wounds, for tuberculosis, and for diseases other than tuberculosis respectively.—Major **Tryon** replied: The answer to the first part of the question is 252,000. In March, 1923, approximately 160,800 awards of 50 per cent. or over were in payment as follows: Eye disabilities 6600, injury to limbs (including amputations) 58,000, other wounds and injuries 22,800, ear disabilities 2800, tuberculosis 30,300, other diseases 40,300.

Small-pox and Vaccination.

Mr. **Trevelyan Thomson** asked the Minister of Health the particulars which indicated that the percentage of cases of small-pox had increased with the reduction in the number of vaccinations which had fallen from 85·6 of births in 1872–81 to 43·4 in 1912–21.—Lord E. **Percy** replied: As my right hon. friend informed the hon. Member on the 4th inst., particulars as to the total number of cases of small-pox in England and Wales are not available for any year prior to 1911, and it is not, therefore, possible to give the desired information for the periods mentioned in the question. The number of cases of small-pox during each of the years 1911 to 1922, and the percentage of vaccination to births in each of those years, are given in the following table:—

Year.	Cases of small-pox.	Percentage of vaccination to births.	Year.	Cases of small-pox.	Percentage of vaccination to births.
1911	289	52·3	1917	7	42·3
1912	121	50·1	1918	63	41·5
1913	113	46·5	1919	311	40·6
1914	65	44·6	1920	280	39·5
1915	93	45·5	1921	336	38·3
1916	159	44·7	1922	973	—*

* Not yet available.

White Lead Convention.

On a vote of £185,969 for the salaries and expenses of the Home Office,

Mr. A. **Greenwood** moved to reduce the vote by £100. He said there were far too many cases of lead poisoning at the present time, and he attributed that to the ineffective administration of the regulations by the Home Office. The whole industry was united, and there was no real reason which should debar the Home Secretary from enforcing on the Cabinet the importance of an early ratification of the White Lead Convention.

Mr. **Turner** seconded.

Mr. G. **Locker-Lampson** (Under-Secretary for the Home Department) said the question of ratifying the White Lead Convention agreed upon at Geneva was not quite so easy as some people might think. The Minister of Labour who was at Geneva agreed to the terms of the agreement, but unfortunately since that date a certain misunderstanding had arisen about one of the principal agreements under the Convention—the employment of young persons under 18 and the employment of women for industrial purposes. Apparently a good many members at Geneva were under the impression that that article referred only to the painting of houses. Other members declared that it referred to the whole of industrial painting. Until that point had been cleared up satisfactorily it was rather difficult for this country to agree to the ratification of the Convention. He hoped, however, the delay would not be very long. Since the Geneva Convention sat a new process had been introduced involving the use of wet sand-paper, by means of which the old dangers arising out of dry rubbing down could be prevented. He thought it was absolutely essential that further experiments should be made with this new material before a definite decision was come to. The Home Office was at present receiving deputations on the subject.

Workmen's Compensation.

Mr. G. SPENCER asked whether the Home Secretary would appoint another medical referee under the Workmen's Compensation Act for the County of Nottingham for dealing with certain industrial diseases. At the present time cases had to be sent to Sheffield, and the men affected had to pay their expenses to Sheffield to be examined in cases in which the certificate given by the certifying surgeon was questioned by a colliery company. He was sorry to say that the workmen in the county of Nottingham had lost faith in the present medical referee, not because they alleged he was unfair, or that he acted in an *ex parte* manner, but because they believed that he was not conducting cases consistently with the description of the disease in the Act. He belonged to the school of medical opinion which held that if objective symptoms were not present, then the disease did not exist.

Mr. LOCKER-LAMPSON said that the point raised by Mr. Spencer was an important one, and the Home Office would consider it.

The motion to reduce the vote was negatived and the vote was agreed to.

FRIDAY, JULY 13TH.

Sale of Liquor to Children.

On the motion for the third reading of the Intoxicating Liquor (Sale to Persons under 18) Bill,

Sir F. BANBURY moved the rejection of the measure. He said he wished to call the attention of Viscountess ASTOR and a number of those who supported the Bill to a speech made by Sir S. Russell-Wells only a few days previously, in which he said that beer was a food and contained a certain quantity of nourishment, and also that tea was a pure drug. Therefore the supporters of the Bill were endeavouring to prevent young people from getting what a medical authority declared to be nourishment and to make them take instead *something* which was after all merely a drug.

Viscountess ASTOR thanked the Government for having given facilities to the Bill.

The Bill was read a third time by 257 votes to 10.

Small-pox and Vaccination.

Lieut.-Colonel ARTHUR MURRAY asked the Minister of Health whether he could state how many of the 408 persons noted as suffering from small-pox for the four weeks ended June 30th were vaccinated at birth and/or were vaccinated at a later period.—Mr. CHAMBERLAIN replied: Information as to the vaccinal condition of these persons is at present available in only 227 of the cases. This information is given in the following statement, but the particulars are subject to revision in the light of further information which may subsequently be received:—

Unvaccinated.	Vaccinated in infancy.	Vaccinated later.		Revaccinated.	Stated to have been vaccinated but showing no cicatrix of vaccination.
		After infancy and before exposure to infection.	After exposure to infection.		
188	31*	1	3	2	2

* Including 2 suspected cases.

Institutional Treatment of Tuberculosis in Leicester.

Major GUY PAGET asked the Minister of Health whether he was aware that the cases for Government treatment for tuberculosis were limited in Leicester to 30; and, seeing that, in view of the fact that every insured person contributed to this treatment, this was an insufficient number, and that in consequence the voluntary institution was overcrowded with surgical tuberculous cases which largely hampered its other work, would he inquire into the matter. —Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the negative. On July 1st the number of persons receiving institutional treatment for tuberculosis from the Leicester Town Council was 217. I am not aware of the actual number of cases of [illegible] tuberculosis included in this figure, but the provision [illegible] by local authorities for the treatment of this [illegible] naturally have the effect of relieving the [illegible] voluntary institutions. In the [illegible] necessity for any special inquiry, and I [illegible] the health insurance contributio[illegible] persons do not now include any [illegible] of institutional treatment for [illegible]

MONDAY, JULY 16TH.

Child Mortality.

Mr. WILLIAM THORNE asked the Minister of Health the number of children who died before the age of 12 months in the London County Council area, Glasgow, West Ham, and Stoke-on-Trent during the year ending March, 1922.—Lord E. PERCY replied: The figures asked for in the question as regards London are 8334; Glasgow, 3644; West Ham, 705; and Stoke-on-Trent, 978. The corresponding infant death-rates per 1000 births for London, West Ham, and Stoke-on-Trent were 82, 83 and 138 respectively.

Insulin Treatment.

Sir WALTER DE FRECE asked the Minister of Health what steps were being taken to bring the insulin treatment within the reach of the very poor.—Lord E. PERCY replied: It is within the powers of guardians, on the advice of the medical officer, to pay for the supply of insulin in cases of destitution.

Pensions Administration in the North of England.

Mr. POTTS asked the Minister of Pensions whether the Yorkshire regional headquarters of the Ministry of Pensions were to be transferred to Newcastle; whether he would state the population in the present Yorkshire area and the population in the northern area which was at present administered from Newcastle; whether the population in the Yorkshire area was approximately nearly double that of the northern; and, if it was eventually intended to administer the entire North of England from one centre, would he consider whether Leeds would offer a balance of advantages.—Captain CRAIG replied: The answer to the first part of the question is in the affirmative; to the second and third parts, that the population of the Yorkshire and northern regions, according to the census of 1921, is 3,917,713 and 2,754,487 respectively; and to the last part that it is not in contemplation to administer the entire north of England from one centre.

Child Adoption.

Mr. GERALD HURST asked the Secretary of State for the Home Department whether he had considered the Report on child adoption made by the committee appointed to make such Report by the Home Office and the two Bills which had been introduced to give effect to its recommendations; and if he could hold out any hopes of the Government bringing in or giving facilities to any Bill for this purpose.—Mr. BRIDGEMAN replied: Yes, Sir. I am afraid the Government cannot undertake to introduce legislation on this subject at the present time, and the pressure of Parliamentary business makes it impossible to give special facilities to a private Member's Bill.

Infantile Mortality.

Captain BOWYER asked the Minister of Health whether he would give the most recent figures showing the death-rate per 1000 of legitimate and illegitimate infant children, respectively; and would he say how these figures compared with those of ten years ago.—Mr. NEVILLE CHAMBERLAIN replied: The most recent figures are those for 1922, in which year the infant death-rate per 1000 children born was 74 in the case of legitimate children and 139 in the case of illegitimate children. The corresponding figures for the year 1912 were 91 and 181 respectively.

Dentists Bill.

The Dentists Bill was read a third time. (The object of this measure is to give ex-Service students of the dental profession extra time to qualify under the provisions of [illegible] 1921 Act.)

TUESDAY, JULY 17TH.

Visiting Committees in Mental Hospitals.

Mr. WILLIAM ALBERT JENKINS asked [illegible] Health if he was aware that at present [illegible] have not the right of full representation [illegible] committees of mental hospitals; and [illegible] make provision for this right [illegible] Parliament.—Lord E. PERCY [illegible] first part of the question [illegible] it is desirable to give [illegible] suggested.

[illegible]

view to determining whether it is practicable to give effect to the recommendations of the departmental committee in regard to whole-milk cheese and cream.

THURSDAY, JULY 12TH.

Medical War Records.

Mr. EDE asked the Minister of Pensions what progress had been made with the preparation of the medical records of the war, what sum had been expended on these records up to June 30th, 1923; when it was anticipated that the record would be completed; and what would be the total cost of the same.—Major TRYON replied: I assume that the hon. Member is referring to the records of admissions to and discharges from ambulances, hospitals, or clearing stations during service. These medical records have now been sorted and indexed in one register, but as the work was commenced by the War Office and completed by the Statistical Division of my department as part of their general duties, I regret I am not in a position to state the cost without very considerable investigation.

Treatment for War Neurosis.

Mr. ROBERT RICHARDSON asked the Minister of Pensions what was the total number of pensioners receiving treatment for war neurosis and other shell-shock conditions, and whether he was satisfied with the provision made in the different regions for the treatment of pensioners suffering from shell-shock and/or neurasthenia.—Major TRYON replied: The number of patients at present receiving treatment under my department for war neurosis is about 6900. The whole question of the treatment of this very difficult condition is kept constantly under review by my medical advisers. Full provision is made for the most modern treatment. I am glad to say that our accommodation is ample and we have no waiting list.

Final Pension Appeals in 1921.

Mr. WHITELEY asked the Minister of Pensions what number of cases were dealt with before the final tribunals in 1921 and 1922 for entitlement and assessment, respectively, and the number of successful cases in each year.—Major TRYON replied: The number of appeals on entitlement decided by the tribunal during 1921 was 43,750, of which 11,500 were allowed. The comparative figures for 1922 are 37,350 and 9,980. The assessment tribunals, which did not commence work until June, 1922, decided 13,023 appeals up to the end of that year. Of these the assessment was increased in 2500 cases and lowered in 23. The final award was set aside in 2500 cases and the appeal disallowed in 8000 cases.

Institutional Treatment of Tuberculosis.

Mr. TREVELYAN THOMSON asked the Minister of Health whether he approved of the charge made to tuberculous persons in the London area in respect of institutional treatment; and, if so, why, in this respect, had the institutional treatment of tuberculous persons been differentiated from that of the other infectious diseases.—Lord E. PERCY replied: My department have approved generally of the arrangement made by the L.C.C. for the assessment of contributions payable by tuberculous persons towards the cost of institutional treatment provided by the Council. As regards the second part of the question, the statutes under which institutional treatment is provided in London for persons suffering from other infectious diseases do not authorise the recovery of any part of the cost of treatment from the patient.

Wounds on Executed Prisoner.

Mr. LANSBURY asked the Secretary of State for the Home Department whether his attention has been called to the fact that at the inquest held on Roland Duck, after his execution at Pentonville prison last week, a severe wound was found on his head and a considerable quantity of congealed blood was attached to his hair; whether the coroner had made a report to him as to how this injury was sustained; and whether the man's father and mother, who attended the inquest, had asked the Home Office to order an inquiry as to the cause of this injury.—Mr. BRIDGEMAN replied: Reports received from the prison showed that when the body was taken down there was no mark on the head, but when the body was being washed, after removal to the mortuary and post-mortem examination of the neck by the medical officer, a bruise was noticed on the forehead. The body had slipped while being placed on the mortuary table and the head had struck a slab. The medical officer called the coroner's attention to the bruise. The coroner's inquisition was sent to me. He made no report, but I have now seen his notes, which show that the jury was satisfied that the bruise was caused after the execution. Before the inquest ended the father said he was satisfied, but both parents have written since expressing dissatisfaction. They will be informed that I find no ground for further inquiry.

Infection in Public Libraries.

Colonel MORDEN asked the Minister of Health whether his attention had been directed to the danger of infection to the frequenters of public libraries through the use of books previously handled by persons suffering from infectious ailments; and whether he would take steps to investigate this menace to the public health by directing local authorities to use adequate disinfectants in the public libraries of this country.—Lord E. PERCY replied: The answer to the first part of the question is in the affirmative, but my right hon. friend is advised that medical officers of health are fully alive to whatever danger of infection there may be from this source. Special provisions as to the precautions to be taken to prevent the spread of infection through the use of library books are contained in Section 59 of the Public Health Acts Amendment Act, 1907, and that section may be put in force in any district on the application of the local authority. In the circumstances the Minister does not consider it necessary to undertake any special investigation or to issue any special instructions to local authorities on this matter.

Fifty per Cent. Pension Awards.

Mr. HERRIOTTS asked the Minister of Pensions the number of pensioners in receipt of a pension of 50 per cent. or over on March 31st, 1919, and the number of pensioners in receipt of a pension of 50 per cent. or over on March 31st, 1923, for loss of vision, for loss of limbs, for loss of hearing, for gunshot wounds, for tuberculosis, and for diseases other than tuberculosis respectively.—Major TRYON replied: The answer to the first part of the question is 252,000. In March, 1923, approximately 160,800 awards of 50 per cent. or over were in payment as follows: Eye disabilities 6600, injury to limbs (including amputations) 58,000, other wounds and injuries 22,800, ear disabilities 2800, tuberculosis 30,300, other diseases 40,300.

Small-pox and Vaccination.

Mr. TREVELYAN THOMSON asked the Minister of Health the particulars which indicated that the percentage of cases of small-pox had increased with the reduction in the number of vaccinations which had fallen from 85·6 of births in 1872–81 to 43·4 in 1912–21.—Lord E. PERCY replied: As my right hon. friend informed the hon. Member on the 4th inst., particulars as to the total number of cases of small-pox in England and Wales are not available for any year prior to 1911, and it is not, therefore, possible to give the desired information for the periods mentioned in the question. The number of cases of small-pox during each of the years 1911 to 1922, and the percentage of vaccination to births in each of those years, are given in the following table:—

Year.	Cases of small-pox.	Percentage of vaccination to births.	Year.	Cases of small-pox.	Percentage of vaccination to births.
1911	289	52·3	1917	7	42·3
1912	121	50·1	1918	63	41·5
1913	113	46·5	1919	311	40·6
1914	65	44·6	1920	280	39·5
1915	93	45·5	1921	336	38·3
1916	159	44·7	1922	973	—*

* Not yet available.

White Lead Convention.

On a vote of £185,969 for the salaries and expenses of the Home Office,

Mr. A. GREENWOOD moved to reduce the vote by £100. He said there were far too many cases of lead poisoning at the present time, and he attributed that to the ineffective administration of the regulations by the Home Office. The whole industry was united, and there was no real reason which should debar the Home Secretary from enforcing on the Cabinet the importance of an early ratification of the White Lead Convention.

Mr. TURNER seconded.

Mr. G. LOCKER-LAMPSON (Under-Secretary for the Home Department) said the question of ratifying the White Lead Convention agreed upon at Geneva was not quite so easy as some people might think. The Minister of Labour who was at Geneva agreed to the terms of the agreement, but unfortunately since that date a certain misunderstanding had arisen about one of the principal agreements under the Convention—the employment of young persons under 18 and the employment of women for industrial purposes. Apparently a good many members at Geneva were under the impression that that article referred only to the painting of houses. Other members declared that it referred to the whole of industrial painting. Until that point had been cleared up satisfactorily it was rather difficult for this country to agree to the ratification of the Convention. He hoped, however, the delay would not be very long. Since the Geneva Convention sat a new process had been introduced

Notes, Comments, and Abstracts.

TYPHUS FEVER EPIDEMIC AMONG THE GREEK REFUGEES.

BY SIR PATRICK HEHIR, K.C.I.E., C.B., C.M.G., M.D. BRUX., F.R.C.S., F.R.C.P. EDIN.,
MAJOR-GENERAL, I.M.S. (RET.): MEDICAL ADVISER, BRITISH RED CROSS SOCIETY IN GREECE.

IT has fallen to my lot to see a great deal of typhus among the Greek refugees during the last four and a half months. As the outbreak presents many points of difference, epidemiologically and otherwise, from the disease as ordinarily met with elsewhere, an account of it may be of interest. The Greek refugees primarily brought the infection with them, and have been moving from one place to another carrying the disease, either in the incubating stage or in a mild ambulatory form. The serious cases are, of course, incapable of movement with the masses.

Epidemiology.

The epidemiological history of the present outbreak is easily understood if one pictures the conditions, economic, political, and military, that have been in existence in relation to these refugees since last autumn. Apparently there is a gradual rise in the intensity of the epidemic until it reaches its acme; this continues for a few months and then the epidemic gradually subsides. There are, however, oscillations in the intensity which, I believe, are mainly associated with variations in meteorological conditions, but doubtless other accidental factors are concerned. With us it began at the end of January, gradually rose in numbers and severity of attacks, reached a maximum about the first fortnight in March, remained stationary for a month or so, and is now undergoing a marked abatement.

It is noteworthy that in areas where refugees have been widely dispersed on the land there has been no typhus, or it has not become epidemic when introduced. Other things being equal, the intensity of the epidemic appears to depend largely upon the economic conditions in existence. The relation of typhus to overcrowding, long misunderstood, is now known to be easily explained by the part that human lice play in the disease. The brunt of the epidemic has been borne by the larger towns—e.g., Athens and its environs, Salonica, Patras, Corfu—the smaller towns escaping to a considerable extent, the incidence being related to the density of population on the occupied area. Whole rural districts in Macedonia and Western Thrace have escaped altogether. The housing conditions of the refugees, their hardships—especially insufficient food and exposure—have considerably lowered their resistance to disease, which, except in the case of minor maladies, runs a serious course and is frequently fatal. This high mortality is important, as it has aroused antipathy to the hospitals; early cases of sickness are hidden, and often hospital relief is only sought when the patient is dangerously ill, this being one of the ways in which typhus is being spread.

The outbreak attained its maximum of intensity in mid-winter. In colder weather the people are more crowded together: they wear thicker clothes, which foster lice, and bathe less frequently. Throughout the winter refugees were packed with the ordinary civil population in the waiting rooms of railway stations and in other places; contact cases were therefore more frequent. As I write this in the British Red Cross train at Salonica railway station, a refugee-train is in a siding; in and around the station yard are, roughly, 500 refugees, all on the way to Seres (Thrace) to take up work on the land. The same sort of arrivals and distributions are occurring in many large railway stations; it is easy to see how communicable disease spreads rapidly among them, and also reaches the stationary populations of towns.

Overcrowding is, however, only one of the factors that enter into the epidemiology of typhus. Other hardships exist: A very large percentage of the refugees get only a bare subsistence allowance of food. In some districts men who can work get no food dole, and out-of-work women get only 6 to 8 ounces of bread or flour a day. Until a few months ago few refugees had a change of clothing; undergarments were especially scarce. A great deal of help has been given them now in this respect, and I know of no camp of any duration that has not been relieved. With only one suit of clothes the practical difficulties of delousing are obvious; the suit is put through the steam disinfector and dried while the refugee is having his bath. The sanitary condition under which refugees lived for months after their return to Greece was indescribably bad: it has, in the last two months or so, been greatly ameliorated.

It is superfluous to state that the infected human louse is the intermediary in the transmission of typhus; ordinarily there is no direct communication of the disease from man to man. If it were possible to exterminate human lice in an infected area the disease would cease. All our radical preventive measures are based on this knowledge. Experienced local medical administrators act on the principle that if there are no lice on the people themselves and their clothes they cannot give the disease to others. Somehow it has got abroad that it is only the body-louse that acts as a carrier. I am all but morally certain that this is not the case, and that the exculpation of *P. capitis* is a dangerous theory.

The micro-organism of typhus passes through a developmental stage in the louse; in that insect it is intracellular, develops, is set free, and is finally discharged into the oral apparatus, from which it is introduced into man. In man it again becomes intracellular, and from the infected cells it is thrown into the blood with its toxins. The louse does not *transmit the virus until four days have elapsed from the time* of its infection; infection of man is in the vast majority of cases through the bite of the louse, and the insect's excreta rubbed into scratches of the skin is also believed to give rise to infection in a small number of cases. So far as I can discover, no original work is being done during this epidemic in regard to the relation of the louse to typhus.

The infectious diseases hospitals for typhus cases in refugees are not ideal institutions, but they might be worse. There is usually a sufficient number of sick attendants, nurses, and doctors, but want of experience as to how to deal with the disease has been evident in several local epidemics. The arrangements for protecting the hospital staff from infected lice was one of the most serious defects I came across. When I visited an infectious diseases hospital some weeks ago a long white coat was given me to wear in the wards. After I had put it on one of the hospital orderlies picked off a louse from the neck, remarking that it was seldom he found one on the assistant director's gown which I was wearing. In one infectious diseases hospital the arrangements for delousing patients admitted were of the most elementary kind, except that a steam-disinfector was occasionally used for the clothing when water was available. There was no bathing of patients on admission, but the hair was cut short. I found that the sanitary arrangements in wards and latrines called for serious improvement—some of the wards were offensive, as several cases of incontinence of urine and fæces were present and the nursing and cleanliness were unsatisfactory. In our own camp one day I found that three cases which the Greek medical officer (himself a refugee) had diagnosed as "fever" had been allowed to remain in the main blocks. All three had lice on their clothes; they were all cases of typhus and two of them already had the rash. In one town a severe epidemic of influenza was reported to exist, but the high mortality aroused suspicion and inquiries by experts were made; it was found that influenza was the minor disease and typhus the real epidemic. The same history was given me by the controlling medical authority in regard to two other towns. As the result of this want of experience several doctors and nurses taking no precautions got the disease and died. It is all but morally certain that anyone attending typhus cases without a knowledge of the nature of the disease will become infected himself sooner or later. It is important to educate the subordinate staff of these hospitals in the ætiology of typhus and the principles adopted in the prevention of infection.

(*To be continued.*)

MEDICAL WORK OF THE MISSION TO LEPERS.

THE forty-eighth annual report of the Mission to Lepers,[1] presented at the annual general meeting of members of the mission at the Central Hall, Westminster, on May 10th, contains a chapter devoted to the medical work of the mission, in which short statements by various medical men and women are quoted. The mission cares for 7735 leper inmates in its own and aided institutions, and also for over 600 untainted children, who are educated and trained in separate homes to become useful members of the healthy community. At Dichpalli, near Nizamabad, Deccan, India, improved results have been obtained by intravenous injection of the ethyl esters of chaulmoogra or hydnocarpus oils, as opposed to intramuscular injection. "This means that very much more of the drug is administered, with consequent signs of improvement. In nodular cases an auto-vaccine is prepared for each patient." In some cases the two methods are combined. The conditions of unrest in China militate against the handling of the leper problem: "In Siao Kan (Central China), since the middle of the war period, we have only encouraged the more pronounced, or chronic, cases to come into residence. This means that we have turned away

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[1] "A Fruitful Field." Mission to Lepers, 33, Henrietta-street, Covent Garden, London, W.C. 2. 6d.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, July 23rd.—10 A.M., Mr. Maingot: Surgical Pathology. 2 P.M., Mr. Addison: Surgical Wards. 3 P.M., Mr. Simson: Diseases of Women.

TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 11 A.M., Mr. Simson: Gynæcological Demonstration. 2 P.M., Dr. Burnford: Medical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. MacDonald: Genito-Urinary Dept. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.

FRIDAY.—11 A.M.; Dr. McDougal: Electrical Dept. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Demonstration of Clinical Cases at 3.30 P.M.

MONDAY, July 23rd.—Dr. J. Browning Alexander: Medical.

TUESDAY.—(3 P.M.) Mr. Howell Evans: Surgical.

WEDNESDAY.—Mr. Norman B. B. Fleming: Eye Cases.

THURSDAY.—Mr. H. W. Carson: Surgical.

FRIDAY.—Dr. C. E. Sundell: Diseases of Children.

Appointments.

ANDERSON, J. B., M.B., Ch.B Aberd., has been appointed District Medical Officer and Public Vaccinator for Bishopwearmouth, West District.

DAVIDSON, G. S., M.B. Aberd., F.R.C.S. Edin., to be Extra Physician (Honorary) to the Aberdeen Maternity Hospital, with special charge of the Out-patient Department.

DAVIES, J. C., M.B., B.Ch. Oxf., Certifying Surgeon under the Factory and Workshop Acts for the Chipping Campden District of the County of Gloucester.

GUEST, D., M.B., Ch.B., Assistant Bacteriologist, University of Sheffield.

LAMONT, D. C., M.B. Edin., D.P.H., Assistant Medical Officer of Health and Tuberculosis Officer; and FRAZER, W. M., M.Sc., M.B., Ch.B. Liverp., Assistant Medical Officer of Health and Assistant School Medical Officer at Blackburn.

M'KENDRICK, W., M.D. Glasg., D.P.H., Medical Officer of Health for Hartlepool.

M'KINNEY, J. W., M.B., Ch.B. Edin., D.P.H. Dub., Medical Officer of Health to the Ballymoney Urban District Council.

Queen Charlotte's Lying-in Hospital: CUTHBERT, J. R., M.B., Ch.B. Otago, N.Z., and HALL, N. B., M.B., B.S. Adelaide, Assistant Resident Medical Officers.

Vacancies.

For further information refer to the advertisement columns.

Canterbury, Kent and Canterbury Hospital.—Res. M.O. £175.

Cheshire Joint Sanatorium, Loggerheads.—A.M.O. £350.

Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S., Cas. O. and Orthopædic H.S. £175 and £170 respectively.

Dreadnought Hospital, Greenwich, S.E.—H.P. £150.

Durham County Hospital.—H.S. £200.

Earlswood, Royal Earlswood Institution.—Med. Supt. £800.

East African Medical Service.—M.O. £600.

East London Hospital for Children.—H.P. £125.

Glasgow University.—Chair of Public Health.

Hemel Hempstead, West Herts Hospital.—Res. M.O. £200.

King's College Hospital, Denmark Hill, S.E.—Jun. Anæst.

King's Lynn, West Norfolk Hospital.—Asst. Res. M.O. £100.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Liverpool, West Derby Union.—Asst. Res. M.O. £300.

London Hospital, E.—Second Registrar to Ear, Throat and Nose Dept. Also First Asst. to each of the Surgical Firms. £400.

Manchester, Baguley Sanatorium.—Third Asst. M.O. £400.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary.—Asst. Res. M.O. £100.

Manchester, Victoria Memorial Jewish Hospital.—Hon. S.

Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Non-Res. H.S. £150.

Mid-Wales Counties Mental Hospital, Talgarth, Breconshire.—Med. Supt. £800.

Middleton-in-Wharfedale Sanatorium, Ilkley.—Res. A.M.O. £325.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. £150.

Northampton County Mental Hospital.—Locum. £8 8s. weekly.

Nottingham Children's Hospital.—Res. H.S. £150.

Rotherham Hospital.—Jun. H.S. £150.

Royal Naval Medical Service.—Surgeon-Lieutenants.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £150.

St. Andrews University Medical School, Dundee.—Chair of Medicine.

St. Bartholomew's Medical College.—Demonstrator of Physiology.

Salvation Army Mothers' Hospital, Clapton.—Sen. Res. Med. Woman.

Tiverton Hospital, Devon.—H.S. £100.

West African Medical Service.—M.O. £660.

Windermere, Ethel Hedley Hospital for Crippled Children.—H.S. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointment: St. Just (Cornwall).

Births, Marriages, and Deaths.

BIRTHS.

ALLCHIN.—On July 9th, at "The Briars, Northwick Park-road, Harrow, the wife of F. M. Allchin, M.B. Lond., of a son.

FIRTH.—On July 13th, at Manchester-square, W., the wife of Douglas Firth, M.D., of a daughter.

HOLMES.—On July 14th, at 29, Manley-road, Whalley Range, Manchester, to Dr. and Mrs. A. Hillyard Holmes, a daughter.

MOORHEAD.—On July 12th, at Little Squerryes, Westerham, the wife of R. Leishman Moorhead, M.B., C.M., of a daughter.

MARRIAGES.

BLOCKLEY—MYERS.—On July 10th, at St. John's Church, Torquay, John P. Blockley, F.R.C.S. Edin., to Effie, widow of James Nutter Myers.

EDEY—EWALD.—On July 9th, at Christ Church, Ramsgate, Thomas Hugh Edey, M.R.C.S., L.R.C.P., to Gladys Yarborough, younger daughter of the late Henry B. Ewald and Mrs. Ewald, of Nelson-crescent, Ramsgate.

DEATHS.

CODNER.—On July 12th, at Woodside, Corfe, near Taunton, John Codner, M.B., C.M. Edin.

PARE.—On July 13th, John William Pare, M.D., L.D.S. Eng., F.R.S. Edin., aged 62.

N.B.—A fee of 7s. 3d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

		£	s.	d.
INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

ROYAL SANITARY INSTITUTE.—The thirty-fourth congress will take place at Hull from July 30th to August 4th, under the presidency of the Rt. Hon. T. R. Ferens, J.P., High Steward of Hull. The inaugural meeting will be held at the Royal Institution, Albion-street, on July 30th at 5 P.M. Sections will be devoted to sanitary science, personal and domestic hygiene, engineering and architecture, and maternity and child welfare (including school hygiene). There will be conferences of the following public health workers: representatives of sanitary authorities, engineers and surveyors, health visitors, port sanitary authorities, veterinary inspectors, and medical officers of health. The meetings of sections and conferences will be held in the School of Art, Anlaby-road, and in the Guildhall. On July 31st, at 8 P.M., Sir Alexander Houston will lecture on "A Pure Water Supply," and on August 2nd, at 8 P.M., Mr. B. Seebohm Rowntree will lecture on "Industry and National Welfare."

An exhibition of apparatus and appliances relating to health and of domestic use will be held, in connexion with the congress, at the Wenlock Barracks, Anlaby-road. Fellows, members, and associates of the Institute are supplied with tickets (£1 11s. 6d. each) on application to the Secretary before the congress, at the offices of the Institute, 90, Buckingham Palace-road, S.W. 1. Tickets for those not connected with the Institute will be issued up to July 27th at the offices of the Institute, or at the offices of the local treasurer at the City Treasurer's Office, Guildhall, Hull, and on the following days at the Reception Room in the School of Art. Ladies' tickets (not including copies of the proceedings) 10s. 6d. each. Lists of hotel and boarding-house accommodation may be obtained on application to the secretaries.

Notes, Comments, and Abstracts.

TYPHUS FEVER EPIDEMIC AMONG THE GREEK REFUGEES.

By Sir Patrick Hehir, K.C.I.E., C.B., C.M.G., M.D. Brux., F.R.C.S., F.R.C.P. Edin.,

MAJOR-GENERAL, I.M.S. (RET.); MEDICAL ADVISER, BRITISH RED CROSS SOCIETY IN GREECE.

It has fallen to my lot to see a great deal of typhus among the Greek refugees during the last four and a half months. As the outbreak presents many points of difference, epidemiologically and otherwise, from the disease as ordinarily met with elsewhere, an account of it may be of interest. The Greek refugees primarily brought the infection with them, and have been moving from one place to another carrying the disease, either in the incubating stage or in a mild ambulatory form. The serious cases are, of course, incapable of movement with the masses.

Epidemiology.

The epidemiological history of the present outbreak is easily understood if one pictures the conditions, economic, political, and military, that have been in existence in relation to these refugees since last autumn. Apparently there is a gradual rise in the intensity of the epidemic until it reaches its acme; this continues for a few months and then the epidemic gradually subsides. There are, however, oscillations in the intensity which, I believe, are mainly associated with variations in meteorological conditions, but doubtless other accidental factors are concerned. With us it began at the end of January, gradually rose in numbers and severity of attacks, reached a maximum about the first fortnight in March, remained stationary for a month or so, and is now undergoing a marked abatement.

It is noteworthy that in areas where refugees have been widely dispersed on the land there has been no typhus, or it has not become epidemic when introduced. Other things being equal, the intensity of the epidemic appears to depend largely upon the economic conditions in existence. The relation of typhus to overcrowding, long misunderstood, is now known to be easily explained by the part that human lice play in the disease. The brunt of the epidemic has been borne by the larger towns—e.g., Athens and its environs, Salonica, Patras, Corfu—the smaller towns escaping to a considerable extent, the incidence being related to the density of population on the occupied area. Whole rural districts in Macedonia and Western Thrace have escaped altogether. The housing conditions of the refugees, their hardships—especially insufficient food and exposure—have considerably lowered their resistance to disease, which, except in the case of minor maladies, runs a serious course and is frequently fatal. This high mortality is important, as it has aroused antipathy to the hospitals; early cases of sickness are hidden, and often hospital relief is only sought when the patient is dangerously ill, this being one of the ways in which typhus is being spread.

The outbreak attained its maximum of intensity in mid-winter. In colder weather the people are more crowded together; they wear thicker clothes, which foster lice, and bathe less frequently. Throughout the winter refugees were packed with the ordinary civil population in the waiting rooms of railway stations and in other places; contact cases were therefore more frequent. As I write this in the British Red Cross train at Salonica railway station, a refugee-train is in a siding; in and around the station yard are, roughly, 500 refugees, all on the way to Seres (Thrace) to take up work on the land. The same sort of arrivals and distributions are occurring in many large railway stations; it is easy to see how communicable disease spreads rapidly among them, and also reaches the stationary populations of towns.

Overcrowding is, however, only one of the factors that enter into the epidemiology of typhus. Other hardships exist: A very large percentage of the refugees get only a bare subsistence allowance of food. In some districts men who can work get no food dole, and out-of-work women get only 6 to 8 ounces of bread or flour a day. Until a few months ago few refugees had a change of clothing; undergarments were especially scarce. A great deal of help has been given them now in this respect, and I know of no camp of any duration that has not been relieved. With only one suit of clothes the practical difficulties of delousing are obvious; the suit is put through the steam disinfector and dried while the refugee is having his bath. The sanitary condition under which refugees lived for months after their return to Greece was indescribably bad; it has, in the last two months or so, been greatly ameliorated.

It is superfluous to state that the infected human louse is the intermediary in the transmission of typhus; ordinarily there is no direct communication of the disease from man to man. If it were possible to exterminate human lice in an infected area the disease would cease. All our radical preventive measures are based on this knowledge. Experienced local medical administrators act on the principle that if there are no lice on the people themselves and their clothes they cannot give the disease to others. Somehow it has got abroad that it is only the body-louse that acts as a carrier. I am all but morally certain that this is not the case, and that the exculpation of *P. capitis* is a dangerous theory.

The micro-organism of typhus passes through a developmental stage in the louse; in that insect it is intracellular, develops, is set free, and is finally discharged into the oral apparatus, from which it is introduced into man. In man it again becomes intracellular, and from the infected cells it is thrown into the blood with its toxins. The louse does not transmit the virus until four days have elapsed from the time of its infection; infection of man is in the vast majority of cases through the bite of the louse, and the insect's excreta rubbed into scratches of the skin is also believed to give rise to infection in a small number of cases. So far as I can discover, no original work is being done during this epidemic in regard to the relation of the louse to typhus.

The infectious diseases hospitals for typhus cases in refugees are not ideal institutions, but they might be worse. There is usually a sufficient number of sick attendants, nurses, and doctors, but want of experience as to how to deal with the disease has been evident in several local epidemics. The arrangements for protecting the hospital staff from infected lice was one of the most serious defects I came across. When I visited an infectious diseases hospital some weeks ago a long white coat was given me to wear in the wards. After I had put it on one of the hospital orderlies picked off a louse from the neck, remarking that it was seldom he found one on the assistant director's gown which I was wearing. In one infectious diseases hospital the arrangements for delousing patients admitted were of the most elementary kind, except that a steam-disinfector was occasionally used for the clothing when water was available. There was no bathing of patients on admission, but the hair was cut short. I found that the sanitary arrangements in wards and latrines called for serious improvement—some of the wards were offensive, as several cases of incontinence of urine and fæces were present and the nursing and cleanliness were unsatisfactory. In our own camp one day I found that three cases which the Greek medical officer (himself a refugee) had diagnosed as "fever" had been allowed to remain in the main blocks. All three had lice on their clothes; they were all cases of typhus and two of them already had the rash. In one town a severe epidemic of influenza was reported to exist, but the high mortality aroused suspicion and inquiries by experts were made; it was found that influenza was the minor disease and typhus the real epidemic. The same history was given me by the controlling medical authority in regard to two other towns. As the result of this want of experience several doctors and nurses taking no precautions got the disease and died. It is all but morally certain that anyone attending typhus cases without a knowledge of the nature of the disease will become infected himself sooner or later. It is important to educate the subordinate staff of these hospitals in the ætiology of typhus and the principles adopted in the prevention of infection.

(*To be continued.*)

MEDICAL WORK OF THE MISSION TO LEPERS.

The forty-eighth annual report of the Mission to Lepers,[1] presented at the annual general meeting of members of the mission at the Central Hall, Westminster, on May 10th, contains a chapter devoted to the medical work of the mission, in which short statements by various medical men and women are quoted. The mission cares for 7735 leper inmates in its own and aided institutions, and also for over 600 untainted children, who are educated and trained in separate homes to become useful members of the healthy community. At Dichpalli, near Nizamabad, Deccan, India, improved results have been obtained by intravenous injection of the ethyl esters of chaulmoogra or hydnocarpus oils, as opposed to intramuscular injection. "This means that very much more of the drug is administered, with consequent signs of improvement. In nodular cases an auto-vaccine is prepared for each patient." In some cases the two methods are combined. The conditions of unrest in China militate against the handling of the leper problem: "In Siao Kan (Central China), since the middle of the war period, we have only encouraged the more pronounced, or chronic, cases to come into residence. This means that we have turned away the very cases which the treatment would have best served, for undeniably the esters act most rapidly in the early stages of the disease." From the Fusan Leper Asylum, Korea, the honorary superintendent writes: "Before we began the chaulmoogra oil treatment our death-rate was always as high as 25 per cent. The inmates had little or no hope of a cure; . . . it was with the greatest difficulty that they could be got to do any kind of work. Now, with the exception of those who are maimed or blind. . . . they form a hive of industry and are as happy a crowd as one can see anywhere. We have already discharged nine cases in which no trace of the disease could be found; and there are, perhaps, double that number who have no active symptoms though they still have some anæsthetic patches. . . . In the first year of the treatment the death-rate was reduced from 25 to 15 per cent., though only about half the patients were given the injections. Since then the percentage in successive years came down to 9, 6, 6, 5, 4, and for the past year it stands at 2½ per cent.; but as half the deaths resulted from an epidemic of typhoid, it may be said that the death-rate from normal causes was only 1¼ per cent. This is specially remarkable when it is remembered that only cases far on in the disease have been admitted for several years. These results are from Dr. Wilson's method of intramuscular injections of whole chaulmoogra oil, camphorated. The new Dean treatment with ethyl esters of chaulmoogra oil gives promise of still better results." In a short article appended to the report Dr. E. Muir, leprosy research worker in the School of Tropical Medicine, Calcutta, states that the most hopeful feature in connexion with leprosy in India is the increasing interest being taken in the problem by the medical profession and the public alike. The leper beggars in the streets have, he remarks, generally reached a stage at which the lepra bacillus has died out of the system; although there is danger from this source, the chief danger is from those who mix in various grades of society, from the highest downward, who are either unaware of, or are concealing, the fact that they are disseminating the disease. Dr. Muir has "come across cooks and house-servants, schoolboys attending school, students attending college, teachers of both sexes instructing the young, confectioners serving over the counter, and men and women in other walks of life, all in a position to spread the disease to those around them."

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[1] "A Fruitful Field." Mission to Lepers, 33, Henrietta-street, Covent Garden, London, W.C. 2. 6*d.*

A NEW GAS-MASK.

CONSIDERABLE study has been devoted since the war to gas warfare in the United States, and the Bureau of Mines of Pittsburg in Pennsylvania has in consequence developed a "universal gas-mask,"[1] which, with its harness, weighs 8½ lb., and protects, though for a short time only, against small doses of most noxious gases. It produces no oxygen, so cannot serve as a protection in atmospheres deprived of oxygen, and no atmosphere which extinguishes a candle can be entered with reliance on this mask; a self-contained oxygen-breathing apparatus must then be used. In this "universal gas-mask" the entering air first passes through (*a*) an activated charcoal, to remove organic vapours, then through (*b*) a filter of cotton-wool to remove smokes, dusts, and mists; next comes (*c*) caustic soda, fused on pumice stone, to remove acid gases. These are followed by (*d*) another cotton-wool filter; (*e*) fused calcium chloride, to extract water vapour which would inhibit the action of the next absorbent; (*f*) "hopcalite," a mixture of oxides of manganese and copper, with sometimes silver and cobalt, to destroy carbon monoxide; and finally (*g*) silica gel for absorbing ammonia. This mask is considered to be safe for six hours of use. It has been used for 14 hours, but not without great risk, for when carbonic oxide absorption is completed and that gas is coming through no warning is given. How thirsty the wearer must have been after inspiring air all that time through fused calcium chloride, and in the dry atmosphere of the United States, too! A smaller equipment for firemen weighs 5½ lb., and gives protection for four hours.

THE TRAINED CLIMBER.

MANY medical men know the value of Swiss mountain air for holidays after heavy work; some make a point of spending a month every year there. For the strenuous mountain-climbing is an attraction, and it is of interest to learn that for the timid amateur who dreads being a drag on other climbers a scientific course of instruction, theoretical and practical, in mountaineering will be given at the end of July in the beautiful village of Klosters, in the Grisons district, at a fee of £6 6s., including board. Full particulars may be had from Gustav Walty, Klosters.

Of importance in this connexion is an article on Muscular Exercise by Prof. A. V. Hill, F.R.S., in *Nature* of July 14th, in which recent work on muscle contraction and recovery is summarised, leading to the modern view that man's power of taking exercise, whether violent or prolonged, depends largely on his ability to run into debt for oxygen. In prolonged effort, such as that associated with climbing, the healthy man is limited not by the magnitude of "debt" into which his body can run—not, that is to say, by the lactic acid maximum of his muscles—but chiefly by the maximum rate at which he can take in oxygen. With regard to the economical use of muscle by the trained athlete, Prof. Hill writes as follows:—

"Clearly if a given movement can be carried out more economically—i.e., at the expense of less energy—then less oxygen will be required for it, and its maximum duration can be increased. . . . This economy of effort can, in part, be taught; but just as all the practice in the world will not turn some quite intelligent people into mathematicians, so all the practice in the world may never turn some quite powerful and well-developed people into first-class athletes. Training and practice are essential, but they can only build on an aptitude already there. If a subject uses his muscles uneconomically . . . he will need an excessive supply of oxygen. Consequently he will be an ineffective athlete . . . he is uneconomical. Athletic prowess depends not only upon a large oxygen supply, but upon a low oxygen requirement."

Skill, power, and economy of muscular effort result, Prof. Hill says, from the effectiveness of the "quick, silent, overmastering, and generally unconscious reactions, dictated by the nervous system on the receipt of urgent messages from tendons, joints, and muscles, or from the little sense organs associated with the ear. . . . The instinctive skill, quickness, and economy of the gymnast or climber, of the mechanic, airman, tennis-player, or athlete, depend upon a vivid and readily reproducible picture in the brain or nervous system, 'a picture,' as Pear puts it, 'of muscular exercise in terms of the sensations which effective and successful movements produce.'"

These considerations are very pertinent to the climbing course at Klosters, and a timely study of them by the would-be climber might save him disappointment.

THE DRIVING GRIP IN GOLF.

To the Editor of THE LANCET.

SIR,—Professional golfers should be grateful to Dr. Wm. Cuthbert Morton for the scientific confirmation in your issue of June 30th of the fact long appreciated by professionals, but difficult to convey to pupils, that the golf club must be held with the wrist slightly extended, "especially the left one," if full power is to be exerted in the grip. Can you explain why this should be? I find golf pupils are much more ready to obey instruction when a logical explanation of the reason for a position can be given. The slanting grip of the fingers with extended wrist seems unnatural and uncomfortable to most beginners.

One further point which Dr. Morton does not elaborate is the general impression among professionals that the grip is principally maintained by the forefinger and thumb of both hands. The real gripping power is, of course, in the flexion of the middle, ring, and little fingers, whereas the strain felt between or with the first finger and thumb is due to the sharp contraction of the first interosseous muscle which approximates finger and thumb to prevent the handle of the club from dropping into the groove or web between them. I am, Sir, yours faithfully,

DAVID ANDERSON.

York Gate, Regent's Park, July 12th, 1923.

PROFESSIONAL CLASSES AID COUNCIL.

THE Professional Classes Aid Council, reconstituted in April, 1921, to carry on and extend the work arising out of the Professional Classes War Relief Council, has now completed its second year of work. The council exists to relieve, or assist in relieving, distress among the professional and other highly educated classes and their dependents, and that work has been steadily consolidated during the past 12 months. As a general rule the council does not give financial assistance to persons suffering from misfortune which could have been naturally foreseen and reasonably provided against, although in such cases helpful advice can frequently be offered. The aim in giving financial assistance is to enable the recipient to become independent of further help. Doctors, nurses, and medical students were among those helped directly and indirectly during 1922, the council of the association being careful to avoid usurping the functions of existing benevolent funds. The direct relief given is at present severely limited by want of funds. The hon. treasurer of the association (of which Sir Clifford Allbutt is a patron and Dr. G. Newton Pitt, representing the Royal Medical Benevolent Fund, a member of the council) is Mr. E. W. Monkhouse, and the offices are at 251, Brompton-road, London, S.W. 3.

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[1] The Military Surgeon, May, vol. lii., p. 555.

An Address

[ABRIDGED]

ON

ENVIRONMENT AND HEALTH.

Being the Presidential Address delivered at the Annual Meeting of the British Medical Association in Portsmouth on July 24th, 1923,

By CHARLES P. CHILDE, F.R.C.S. Eng., M.R.C.P. Edin.,

SENIOR SURGEON, ROYAL PORTSMOUTH HOSPITAL.

[After welcoming the members of the Association and calling attention to the previous meeting held at Portsmouth in 1899, Mr. Childe commented on the past history and present development of the town. He proceeded :—]

During the past fifty years medicine has done infinitely more to constitute itself a science than in all the previous ages. This has been mainly due to the flood of light thrown upon the specific ætiology of many diseases by the epoch-making discoveries of Pasteur, and the stimulus those discoveries have given to other workers. Previous to this almost nothing was known of the agencies concerned in the onset of any diseases, except those of purely mechanical origin. Of such widespread and prevalent disorders as the surgical infections, enteric fever, tuberculosis, diphtheria, syphilis, malarial fever, pneumonia, and many others, the causes were entirely unknown, the speculations and theories as to their origins were various—" Quot homines, tot sententiæ "—and their treatment was entirely empirical. All disease was a mystery. A great deal of it is no longer a mystery. Approximately one-half of the diseases with which we are acquainted are now known to have their origin in infection by living organisms belonging either to the plant or to the animal kingdom, and the probability is that the list is not yet nearly exhausted. Besides this, it has been computed that nearly half the deaths that occur annually are traceable to the same cause.

With the emergence of medicine from the mysterious no less a revolution has occurred in the practitioner of medicine. While a good bedside manner is still a valuable asset, and will so remain in so far as it connotes a sympathetic and human attitude towards the sick and suffering, and while from a business point of view a good shop-front no doubt has its value, no longer are the doctor's brains assessed by the sheen of his tall hat or the length of his frock-coat. Like medicine, the doctor has become less mysterious, less aloof from and superior to his fellow men. Knowing more he has become less omniscient. Standing on surer ground he has become less pretentious. The medical priestcraft, reminiscent of a time when the medicine-man was more priest than physician, and more charlatan than either, has disappeared or is disappearing. This is all to the good, and tends to a more enlightened confidence between doctor and patient.

Again, so much relating to the discoveries and advances in medicine nowadays finds its way into the lay press that the general public has, apart from its technical aspects, a broad knowledge of the progress medicine is making, and is alive to its new developments. This is again to the good. A strong opposition is always an incentive to good government. The advent of a wideawake and informed public tends to keep the profession up to the mark. It adds nothing to the dignity, not to mention the security, of the doctor to be questioned by his patient on some new treatment or phase of a disease he has never heard of, but with which he finds his patient has more than a bowing acquaintance.

It was a natural sequence of the elucidation of the causative agent in many of the infectious diseases that scientific effort should be directed to two main objectives: first, to the discovery of means of producing an artificial immunity similar to the active natural immunity which it was a matter of common knowledge resulted after recovery from an attack of many of them; secondly, to producing immunity reactions which should have the effect of neutralising the toxic products of the invading organisms during an attack. In both of these directions remarkable results have been achieved, both by what is known as vaccine prophylaxis and therapy, and antiserum prophylaxis and therapy.

Successes in Prophylaxis.

The most completely successful example of *vaccine prophylaxis* is that of vaccination against small-pox, introduced by Jenner in 1798. This remarkable discovery was the result of shrewd observation and logical deduction. It was, nevertheless, empirical; the principle on which it rested was not understood until the work of Pasteur more than half a century later. In countries where vaccination is twice practised, small-pox has practically ceased to exist, and its sporadic outbreak from time to time is a warning to the public of neglect of the means to prevent it. In typhoid and paratyphoid fever, by measures along the same lines, immunity lasting for a period of one or two years can be secured, and has greatly reduced the incidence of these diseases both among civilians and soldiers.

Again, the mortality from rabies has been reduced from 16 per cent. to a fraction of 1 per cent., an active immunity being capable of being produced here after infection has already taken place, owing to the lengthy incubation period of the disease. *Vaccine therapy*—that is, the production of active immunity after attack by a known micro-organism—so ably advocated by our own countryman, Sir Almroth Wright, has given very beneficial results in staphylococcus infections, skin affections, &c. Of *antiserum prophylaxis* the best example is that obtained in tetanus. The mortality following Fourth of July injuries in America has ceased to exist owing to its use, and no less life-saving results were obtained by the same means in the Great War. The most familiar and the most successful instance of *antiserum therapy* is that of diphtheria, which has reduced the mortality from 40 to 10 per cent., and, if used on the first day of the disease, to almost *nil*.

These are veritable triumphs of strictly scientific medicine. In other diseases more or less success has been achieved. But closer investigation has shown that there are many factors requiring elucidation which undoubtedly influence the result—such as choice of route, recognition of different types of the same disease, &c.—and it will certainly take many years of patient endeavour before the ultimate possible results in securing immunity are obtained. In many instances prophylaxis or cure has eluded us, and the results have proved disappointing. The above may be termed the result of scientific effort, either preventive or curative, directed towards the individual.

There are other diseases, which have been attacked from a totally different angle—namely, by studying and combating conditions which favour the growth, dissemination, and virulence of the infecting organism, by so altering environment and increasing natural resistance, whatever that may precisely mean, that many diseases which have been very prevalent and very fatal in the past have almost or entirely ceased to exist, and are no longer of any account. Let me give you one or two very familiar examples.

Take typhus fever. During the last century it prevailed in all the large cities of Great Britain and the Continent. So late as 1875 in England and Wales there were 1499 deaths from the disease. During recent years the name " typhus " has seldom appeared in the Registrar-General's returns. It is a disease essentially dependent on filth and overcrowding. Bad as these conditions are even now in our large industrial centres, the disappearance of this disease is evidence of an improvement as compared with half a century ago—an improvement in environment and an improvement in natural resistance, owing to better living conditions, sufficient to have caused its disappearance altogether.

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After the peace of 1815, following a long and exhausting war, when the economic position was somewhat similar to that existing at the present time, typhus fever and relapsing fever, which occurs under similar conditions to typhus, were rife in England and Ireland. No such catastrophe has accompanied the economic depression following the last Great War.

Take, again, typhoid fever. It is a water-borne disease. Bad drainage and a contaminated water-supply are the factors favouring its distribution. Its prevalence or the reverse in a community is the measure of their sanitary intelligence and enterprise. Filth, overcrowding, and bad ventilation are factors conducing to its prevalence, by lowering natural resistance. The marked decline in typhoid fever is again the result of an improvement in environment. Typhoid fever has declined from 375 per million in 1870 to 25 per million at the present time. In Portsmouth typhoid fever, quite prevalent in the town when I came here 30 years ago, has almost ceased to exist.

These are examples of diseases which have disappeared, or are disappearing, owing to action following an intelligent study and comprehension of the conditions and environment favouring their distribution.

Now, "environment" is obviously a very wide term. It embraces living conditions generally. The amount and quality of food and water, the presence or absence of domestic hygiene, the supply or not of good drainage, the furnishing or not of healthy conditions in factory and workshop, the prevalence or not of smoke and fog, the provision or not of adequate open spaces, playgrounds, and recreation grounds, access or not to sound education—these and many others are all factors in environment. And it is satisfactory to note that these matters are receiving from governments and local authorities some of the attention which all of them deserve. But I propose to-night to consider for a few moments the special environmental factors governing the slum areas of our great industrial centres—the lack of fresh air and sunlight, and the cramped and penalising conditions to health, both moral and physical, owing to overcrowding; and to inquire what bearing these factors have upon four out of five of the most formidable endemic scourges which afflict all northern civilised peoples to-day.

THE BEARING OF ENVIRONMENTAL FACTORS ON DIFFERENT DISEASES.

The five scourges I allude to are cancer, tuberculosis, rickets, venereal disease, and alcoholism. Tuberculosis and rickets account for most of the cripples we see about us; cancer, tuberculosis, venereal disease, and alcoholism account for most of the deaths; venereal disease and alcoholism account for most of the misery and moral degradation of our race.

Cancer.

We may dismiss cancer at once from the count. The humiliating confession must be made that we know very little about it. That it has some relation to civilised environment seems evident from the fact that it is a comparatively rare disease among primitive races, and that it is certainly making rapid headway among all civilised peoples. But of the nature of the environment favouring its activities we are in complete ignorance. It is neither foul air nor fresh air, neither hardship nor indulgence, neither poverty nor riches. Cancer like death—

"Æquo pulsat pede pauperum tabernas,
Regumque turres."

The only things we know about it which are worth knowing are its age-incidence, its relation to chronic irritation, and the fact that it is in its beginnings a local disease, and that therefore it can be cured by early removal in those situations where removal is possible.

This is practically all we know about cancer. I wish to make only two comments. The first is that this knowledge is not enough. In an age which has yielded secrets of so many diseases it is a point of honour with the medical profession not to rest content till this pressing problem has been solved. With the public it is not only an obligation but, from the point of view of their own interest and safety, a vital necessity to furnish the financial means of solution, and to see to it that research is not crippled or stinted by any niggardly parsimony.

The second comment I make is this: The most important fact we know about the disease is that in its beginnings it is local, and that its course is a centrifugal spread from its local point of origin. Is that knowledge anything like as productive as it might be? Undoubtedly it is not. Notwithstanding the fact that cancer has been cured over and over again by modern operation—a fact which in itself proves that it is curable—yet I believe patients come no earlier to the doctor with it than they did 30 years ago, though time is the very condition of the only cure we possess for it. Many medical men, and I confess I am one of them, are of opinion that there is considerable room for improvement in this direction. Without resort to any sensationalism some obvious steps could be taken to spread the knowledge of a few very simple facts about cancer. This would give a by no means unwarranted ray of hope to the public and would enable some of the victims of this terrible disease to apply in time to have, at all events, a chance of cure or freedom from recurrence, whichever you like to call it. This by the way.

I pass on to the consideration of the other four scourges—tuberculosis, rickets, venereal disease, and alcoholism.

Tuberculosis.

Tuberculosis first. We know the cause; it is the tubercle bacillus. We know also the prime and essential conditions of its cure; they are fresh air and sunlight. These are not only the essential conditions of its cure, but are almost the sole conditions. Those of you who are interested in the subject will have an opportunity of visiting the establishments at Alton and Hayling Island, under the able administration of Sir Henry Gauvain, where the cures are fresh air and sunlight. Dr. A. Rollier, of Leysin, read a most instructive paper at the Glasgow meeting last year, and quoted many instances of cures, and lasting cures, by these agencies in all regions of the body. It is foreign to my purpose to discuss to-night the method or supposed method of their action, or the method of their application. If, then, these agencies, fresh air and sunlight, are, as we know they are, so powerfully antagonistic to tuberculosis—whether by directly controlling the activities and virulence of the tubercle bacillus itself or by fortifying the natural resistance and so enabling the human organism to establish an immunity to it (it matters not, the result is the same)—are we not justified in the converse conclusion, that the breeding ground of this disease, the environment most encouraging to its activities, are the sunless, airless, overcrowded, and insanitary slum areas of our great cities, where houses are built 40 or more to the acre, and stand back to back, and side to side, like any jig-saw puzzle, so that fresh air and sunlight, the proved destructive agents of the tubercle bacillus, can never enter? Is it a sound economic proposition to equip and maintain, at the cost of millions of the taxpayer's money, sanatoriums for the so-called cure of tuberculosis, while we guard intact the very preserves of this disease by the exclusion of fresh air and sunlight, which cost nothing at all, and maintain in our midst a soil which can breed more tuberculosis in a week than all our sanatoriums can cure in a year? Dr. Rollier says:—

> "Housing has played an immense part in the genesis of child and adult tuberculosis; the community bears the responsibility of the waste of human lives through insanitary houses."

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In 1885 the tuberculosis gland cases admitted to the Alexandra Hospital for Sick Children, Brighton, constituted 6·5 per cent. of all admissions. In 1899 they were 3·5 per cent.—a reduction of nearly 50 per cent. Between 1885 and 1899 Brighton has swept away most of its insanitary areas. Numbers of similar instances could be quoted. It is no unwarrantable assumption that by permitting—and that is all we have to do—the sun and fresh air into our slum areas we should see a very marked general decline in the incidence of tuberculosis.

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Consider next rickets. Its ætiology is unknown. There are two opposing theories as to its origin—the dietetic and the hygienic. There are those who positively assert that it is a deficiency disease; that it is due mainly to lack of fat-soluble A. There are others who as stoutly deny that diet has anything to do with it. We may leave the theorists to settle their differences and turn our attention to certain facts about it which have long been established, and certain other facts which have recently come to light. It never occurs among races living under natural conditions, and is especially prevalent among the poor in Europe and America living under so-called civilised industrial conditions—in other words, the thoroughly bad hygienic conditions of overcrowding and absence of fresh air and sunlight. Among the well-to-do it is practically unknown. In India, on the other hand, as recently shown by Hutchinson, it is a disease of the rich. It does not occur among the poor labouring class who live an open-air life, but is prevalent among the rich Mohammedans and Hindus, who are confined in airless and sunless rooms. Hutchinson discovered also this remarkable fact—that late rickets was restricted to females, who alone are confined, according to the purdah system of isolation as practised by the wealthy natives of India. Again, eminent observers in Glasgow, who have quite an exceptional acquaintance with rickets—it being, as you know, very prevalent in that city—have always associated the disease with overcrowding and lack of hygienic conditions and sunshine, which you also know are conspicuous features of that great hive of industry. According to Miss Fergusson, 50 per cent. of the children in the poor quarters of Glasgow are rickety—a vastly smaller proportion in garden cities, such as Bournville. The prevalence of rickets, she says, is associated with close confinement in tenements. Most important of all, we have the recent experiments of the Lister Institute in Vienna. They prove conclusively that a deficient diet can only produce rickets in the absence of sunlight. If abundant sunlight be present a deficient diet is powerless to give rise to it. Lastly, we have the significant fact that the sun's rays without any other treatment whatever can cure it—an explanation of the oft-repeated dictum that anybody can cure rickets in the summer.

All this does not prove that the absence of fresh air and sunlight is the cause of rickets; but it does prove this—that in overcrowding, confinement, want of fresh air and sunlight, we have an environment conducive to the development of rickets, either by the supply of conditions favourable to the activities of the virus, whether microbic or otherwise, or by lowering natural resistance to it. Conversely, that fresh air and sunlight and good hygienic conditions furnish an environment which is powerfully antagonistic to the disease; that they have either the power of damping down the activities of the virus whatever it is, or that they can so alter the metabolism of the body as to provide an increased resistance and immunity to it. Whichever is the method, the result is the same. These facts appear to indicate clearly and unmistakably the way to the control of this crippling and dangerous disease. And, as Mellanby says, its eradication would do away with a great deal of the bone deformity, improve the physique, lower the infantile mortality, and, most important of all, improve the teeth of the people of this country beyond recognition.

Venereal Diseases.

Let me invite your attention in the next place to venereal diseases, which have figured so largely in the public eye during recent years, are discussed in every drawing-room, exhibited at every picture-house, and with regard to the most suitable methods of controlling which there are acute differences of opinion, both among medical men and the lay public. They are the diseases of immorality. The contributing environmental factor here is the indiscriminate admixture of the sexes of all ages, a necessity of their living conditions. It is not, of course, contended that by an improvement in housing immorality would be stamped out, but it is contended that the conditions of overcrowding, without regard to age or sex, which exist in our industrial centres make the practice of morality wellnigh impossible.

Let me put before you a few facts; they are taken from the report of Dr. A. K. Chalmers, the medical officer of health for Glasgow, for 1921. There is no intention to single out that city as a sink of iniquity, or an example of a condition of things peculiarly revolting to the conscience of civilised humanity, and I have very little doubt its case could be paralleled in our own borough of Portsmouth; but I have the facts for Glasgow, and I have not similar facts for Portsmouth. In Glasgow, out of a population exceeding a million, over 600,000 live in one-roomed or two-roomed tenements. Under the heading "Sex overcrowding in small houses," Dr. Chalmers gives the following appalling examples:—

> "In a one-roomed house a father of 52 occupied the same bed with a mentally defective daughter of 24, who had an illegitimate child of 10. In another, with space for five adults, a father and daughter shared the same bed. In another a mother shared the same bed with two sons of 19 and 20 years respectively. In two-roomed houses, in one instance a son of 19 and a daughter of 21 occupied the same bed; and in another a son of 19 and a daughter of 25, who was pregnant."

However revolting these facts may be, it is right that the public should be made aware of them. This, then, being an example of the state of affairs in our industrial centres, it may be confidently stated that a great deal, at all events, of immorality and its consequences, venereal disease, is the direct result of environment—that the conditions existing make either the teaching or practice of morality impossible, and furnish the breeding ground for venereal disease.

Have we not, it may be asked, missed one phase of the problem, and are we not somewhat out of touch with the situation, with our societies for the prevention of venereal disease and for combating venereal disease quarrelling amongst themselves as to the best means of meeting the evil, and local authorities and the lay public equally divided, when conditions such as I have depicted are rampant in our midst? It is this aspect of the problem—the immorality and its consequence, venereal disease, which are the direct result of overcrowding without regard to age or sex—which I wish to lay particular stress upon here.

The Abuse of Alcohol.

Consider, lastly, the abuse of alcohol. There is no doubt that, without anything in the nature of prohibition in this country (and I believe it to be foreign to the instincts of our people to have their lives, what they may eat, and what they may drink, regulated by the policeman), there has taken place during the past 50 years a steady move in the direction of greater sobriety among all classes of the community. Among the upper and middle classes drunkenness was the fashion less than a century ago. It is now a disgrace. In the army, navy, and mercantile marine there was, 50 years ago, infinitely more drinking than there is to-day. In the streets of our towns the drunken man of any class is not nearly such a familiar sight as he was a generation ago. This must be attributed broa

After the peace of 1815, following a long and exhausting war, when the economic position was somewhat similar to that existing at the present time, typhus fever and relapsing fever, which occurs under similar conditions to typhus, were rife in England and Ireland. No such catastrophe has accompanied the economic depression following the last Great War.

Take, again, typhoid fever. It is a water-borne disease. Bad drainage and a contaminated water-supply are the factors favouring its distribution. Its prevalence or the reverse in a community is the measure of their sanitary intelligence and enterprise. Filth, overcrowding, and bad ventilation are factors conducing to its prevalence, by lowering natural resistance. The marked decline in typhoid fever is again the result of an improvement in environment. Typhoid fever has declined from 375 per million in 1870 to 25 per million at the present time. In Portsmouth typhoid fever, quite prevalent in the town when I came here 30 years ago, has almost ceased to exist.

These are examples of diseases which have disappeared, or are disappearing, owing to action following an intelligent study and comprehension of the conditions and environment favouring their distribution.

Now, "environment" is obviously a very wide term. It embraces living conditions generally. The amount and quality of food and water, the presence or absence of domestic hygiene, the supply or not of good drainage, the furnishing or not of healthy conditions in factory and workshop, the prevalence or not of smoke and fog, the provision or not of adequate open spaces, playgrounds, and recreation grounds, access or not to sound education—these and many others are all factors in environment. And it is satisfactory to note that these matters are receiving from governments and local authorities some of the attention which all of them deserve. But I propose to-night to consider for a few moments the special environmental factors governing the slum areas of our great industrial centres—the lack of fresh air and sunlight, and the cramped and penalising conditions to health, both moral and physical, owing to overcrowding; and to inquire what bearing these factors have upon four out of five of the most formidable endemic scourges which afflict all northern civilised peoples to-day.

THE BEARING OF ENVIRONMENTAL FACTORS ON DIFFERENT DISEASES.

The five scourges I allude to are cancer, tuberculosis, rickets, venereal disease, and alcoholism. Tuberculosis and rickets account for most of the cripples we see about us; cancer, tuberculosis, venereal disease, and alcoholism account for most of the deaths; venereal disease and alcoholism account for most of the misery and moral degradation of our race.

Cancer.

We may dismiss cancer at once from the count. The humiliating confession must be made that we know very little about it. That it has some relation to civilised environment seems evident from the fact that it is a comparatively rare disease among primitive races, and that it is certainly making rapid headway among all civilised peoples. But of the nature of the environment favouring its activities we are in complete ignorance. It is neither foul air nor fresh air, neither hardship nor indulgence, neither poverty nor riches. Cancer like death—

"Æquo pulsat pede pauperum tabernas,
Regumque turres."

The only things we know about it which are worth knowing are its age-incidence, its relation to chronic irritation, and the fact that it is in its beginnings a local disease, and that therefore it can be cured by early removal in those situations where removal is possible.

This is practically all we know about cancer. I wish to make only two comments. The first is that this knowledge is not enough. In an age which has yielded secrets of so many diseases it is a point of honour with the medical profession not to rest content till this pressing problem has been solved. With the public it is not only an obligation but, from the point of view of their own interest and safety, a vital necessity to furnish the financial means of solution, and to see to it that research is not crippled or stinted by any niggardly parsimony.

The second comment I make is this: The most important fact we know about the disease is that in its beginnings it is local, and that its course is a centrifugal spread from its local point of origin. Is that knowledge anything like as productive as it might be? Undoubtedly it is not. Notwithstanding the fact that cancer has been cured over and over again by modern operation—a fact which in itself proves that it is curable—yet I believe patients come no earlier to the doctor with it than they did 30 years ago, though time is the very condition of the only cure we possess for it. Many medical men, and I confess I am one of them, are of opinion that there is considerable room for improvement in this direction. Without resort to any sensationalism some obvious steps could be taken to spread the knowledge of a few very simple facts about cancer. This would give a by no means unwarranted ray of hope to the public and would enable some of the victims of this terrible disease to apply in time to have, at all events, a chance of cure or freedom from recurrence, whichever you like to call it. This by the way.

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The Economics of the Abolition of Slum Areas.

In the foregoing remarks I have endeavoured to emphasise the relation of the special environmental factors of the slum areas—lack of fresh air and sunlight, and overcrowding—to four out of five of the great endemic scourges afflicting the community at the present time. I have said nothing of their relation to epidemic diseases, though there is no doubt that some of the latter are powerfully influenced by the same factors. For instance, pneumococcus lung infection is certainly a disease mainly of cities and crowded places, the infection spreading from pre-existing cases or healthy carriers. Observations in South Africa showed that natives who had recently arrived at the mines and occupied crowded compounds were most susceptible; and Gorgas, in a report upon pneumonia in the Rand mines, draws attention to the fact that there was the same high incidence among labourers in the Panama Canal zone, until they were removed from crowded compounds and encouraged to live in separate huts. The high mortality attending measles is probably attributable to similar conditions. Epidemic disease is, however, more elusive and less under control, and for that reason I have omitted it from argument.

If, then, I have submitted evidence that, by a determined attack upon our slum areas, there would be a reasonable expectation of making a beginning of the end of four out of five of our most formidable endemic diseases, the question is, Would it be worth while? Not as a sociological venture, or on humanitarian grounds, or as a moral obligation, on any of which there would be little difference of opinion; but "would it be worth while" as a business proposition? Because, however satisfying it may be to our consciences to prate of social and moral duties to our fellow men, when it comes to doing anything, and especially to spending taxpayers' and ratepayers' money, it is usually the business and economic aspect of any question which mostly counts. It is, therefore, from this point of view only that I approach it, and I omit all moral considerations. Besides, moral values cannot be assessed in pounds, shillings, and pence, though nobody would deny that they represent a very real asset.

In a paper read at the meeting in Glasgow last year entitled "The Economics of Public Health" Lieut.-Colonel Fremantle, consulting medical officer of health for the County of Herts, by a series of calculations, estimates the total direct material loss in England and Wales from sickness and disability at a minimum of £150,000,000 a year. From tubercle alone the estimated loss is £94,000,000 a year. In the United States of America, with a population three times as great as England and Wales, the estimated cost of sickness and death is £600,000,000 a year, of which at least one-third is considered preventable. Taking the cost to this country of sickness and disablement at £150,000,000 per annum, the country could spend without loss £50,000,000 annually, or, capitalised at 5 per cent., £1,000,000,000 on clearing the slum areas and securing better housing and living accommodation, provided that the cost of sickness and disablement were thereby reduced by one-third.

What actual sum would go to the credit side of the nation's health bill it is obviously impossible to determine. It would admittedly, therefore, be a speculation. But it would not be a bogus venture. An assured dividend of considerable amount is in sight. The improved physique of the nation; its better health; the diminution certainly, the extinction possibly, of such diseases as tuberculosis and rickets; the improved moral tone of the people, and the resultant diminution of venereal disease and its consequences; decrease in the consumption of alcohol with its disastrous effects on infantile and adult mortality, with the misery and moral degradation it brings to the home, with the loss of time, increase of industrial accidents and industrial inefficiency it entails—these and other items are the prospective dividend. Whether it would or not strike £50,000,000 off the annual health bill is the speculation. In this connexion I would remind the over-cautious and those averse to any kind of speculation or any degree of risk, that it is the speculators who have made this great empire—the men of courage and enterprise, men who have faced the uncertain and the unknown, and have not been afraid to take risks. And if we have not been afraid to speculate in adventure, in arms, in trade, and in business, why should we be afraid to speculate in health?

To face the risk would require a bold and imaginative statesmanship. It does not belong to the business outlook of the parish pump, only prepared to estimate in pounds, shillings, and pence the return on the capital expenditure. It would almost certainly eventually result in a real economy to the State. What we are doing now is to provide the breeding-ground for the mass production of disease with one hand, and with the other paying out millions of the taxpayers' and ratepayers' money to deal with the end-results of the very diseases we are fostering in our midst. It has been frequently said, the people make the slums. Such a pessimistic assumption would sound the death-knell of all progress. But it is nothing more than the comfortable argument of the man selfishly indifferent to the obligations of citizenship and regardless of his duty to the body-politic. It is flatly contradicted by the fact that through all the ages man, like every other living thing, has been the product, not the cause, of his environment. The slums make the people you find in them, and the only astonishing fact is that they can breed any other sort. It is a testimony to their physique and spirit and grit, no less than to the universal natural law of the survival of the fittest, that some of the inhabitants of the slums win through such an environment and escape the moral and physical ruin which engulfs those of weaker fibre.

The industrial revolution which occurred in the last century accounted for the urbanisation of our population, and the herding together of millions of workers in our industrial centres. This has been going on ever since. The early hour at which work commenced, the long working day, entire absence of rapid transport, or rather of any transport at all, necessitated their centralisation in the heart of our great towns, where land has consequently become of greater value than health. These conditions are reversed to-day. Powerful centrifugal forces have come into play, and have come to stay. The working day as a rule begins later, the hours are shorter, the day for half the year is longer owing to the Daylight Saving Act, and the means of rapid transport are available, and are becoming increasingly available every year. It has become, therefore, practicable in many instances for the worker to live further from his work—in other words, to move from the centre towards the periphery of our large towns, where land is cheaper and where it becomes, therefore, a business proposition to build on town-planning lines, and avoid the past errors of herding human beings together like sheep in a pen or pigs in a sty.

Air Space and Sun Space.

In this connexion it would seem that the first and most essential requirement in future building is to reduce the density of the houses—in other words, the number to the acre; and it is disappointing, and in the opinion of many a grave defect in the Government's last Housing Bill, that no such restriction appears. In submitting town-planning schemes, however, local authorities have, under the Housing Acts, powers to regulate for this, and a memorandum from the Ministry of Health suggests 12, 10, or 8 houses to the gross acre as suitable density requirements according to the nature of the neighbourhood. If this in the opinion of the Ministry is the correct requirement for health, what are we to say about houses built 40 or more to the acre? The only answer is that they should be swept away wholesale at the earliest possible opportunity.

The air space and sun space round the house is of infinitely more importance than the size of the house itself, or whether it contains a parlour or not. The cramped crofter's cottage does not produce rickets and tuberculosis, because his children live mostly in the sun and air round their dwelling; but children "cabined, cribbed, confined" in the dark sunless and airless environment of our large towns are inviting both all the time. The most important educational requirement of domestic hygiene and its highest fulfilment is the open window, night and day, summer and winter. It is astonishing how quickly the human organism abjures the hothouse conditions of civilised living and adapts itself to its natural environment, fresh air. The tuberculous patient, after three months' open-air treatment in a sanatorium, cannot endure the closed window in his own home. The tuberculous children at Leysin in Switzerland, and at Alton and Hayling Island in this country, live practically naked in the open air, and by that habit and that habit alone throw off a most formidable and deadly disease. Why, then, all the care of healthy children, with their active metabolism capable of adapting itself to almost any requirement, to wrap them up in the warmest of clothing, confine them in hot rooms with windows shut, keep every draught from their bodies, and submit them to general hothouse conditions suitable only to the old whose metabolism is barely sufficient to keep body and soul together, and whose clock has almost run down?

Modern civilisation is suffocating itself in the polluted atmosphere and darkness of our great industrial cities. The need of pure air and sunlight, of which there is plenty about, and to be had for nothing, was never so insistent as it is to-day. These great gifts of nature were plentifully supplied to primitive man, and were his *only* sure defence against disease. They are as bountifully given to civilised man, but he seems to have lost sight of their value, or to have deliberately turned his back on them, while he requires a whole volume for the mere nomenclature of his innumerable diseases.

Sociology and Medicine.

Perhaps apology is needed for touching to-night on a problem which may be considered rather a sociological one than one of strictly scientific medicine. But apart from the fact that I believe a wide latitude is permitted in the Presidential Address to this Association, my choice of subject can, I think, be justified by both local and general as well as scientific considerations. First of all, it does not seem to be an unfitting subject to bring to your notice in the town which bred Charles Dickens and Walter Besant, who devoted their unrivalled literary talents to depicting scenes and characters drawn from our slums, and such as our slums are only too familiar with. Secondly, although this borough has witnessed some of the most brilliant pageants and displays in the history of this country, and although you are sitting here in what we are proud to think is one of the finest town-halls in the kingdom, yet there is an obverse to the shield, and round the corner we can introduce you to slums as pestilential and overcrowded as any to be found in the land. Further, although the environment of the wage-earning classes, in our industrial centres, and its effects may in part be a sociological question, I have endeavoured to show that it is inseparably linked up with, and *is* in fact the greatest of all our problems of preventive medicine, the most rational and the most scientific of all medicine. And if this is so, then it is up to the medical profession, both individually and through this great Association of medical men, to educate and lead public opinion in this matter, and to strengthen the hands of governments and local authorities, on whom will ultimately devolve the responsibility, no less than the odium, of providing the remedy. Concentration on the prevention of disease, on strengthening resistance to disease, by the improvement of environment, rather than on the search for cures or palliatives when the damage is already done; more attention to stimulating and fortifying the natural defensive mechanisms against disease, less to direct attack on disease itself; as Professor Wynne so ably put it last year, concentration on the environment rather than on the individual—this appears to me to be the most scientific, the most economical, and the most productive means of combating the worst of the evils from which the community suffers. If, in conclusion, I might sound a personal note, it is this—that as Chairman of the Health and Housing Committee of this great borough, by the goodwill of my colleagues on the Council, this is a conclusion forced upon me by no mere theoretical considerations, but by an everyday acquaintance with undeniable facts.

PRIMARY AND SECONDARY RESISTANCE TO THE INDUCTION OF CANCER.[1]

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I.—PRIMARY RESISTANCE.

THE researches on experimental carcinogenesis of the past ten years have familiarised pathologists with the constancy with which a continuation of the effective stimulation over a considerable time is essential to successful induction of cancer. This feature of the course of such experiments harmonises with the chronic character of the irritations which clinical experience of the disease in man and animals has shown to be nearly universal in those forms of the disease where such a nexus can be inferred. Taken in conjunction with the histological identity of the lesions, it gives us reasonable assurance of the fundamental identity of the processes involved in cancer as it occurs naturally and under experiment. Of all the methods which have been used to produce cancer in experimental animals (X rays, animal parasites, tar, paraffin, arsenic) the application of tar, or tar products, has been most widely employed, and our knowledge of its action is correspondingly extensive. In what follows this is the only method to which reference will be made, but it must be clearly understood that once malignant growth has been started by this means, there are no characters, clinical or microscopic, by which the tumours can be distinguished from those of the same tissue produced by other agencies or arising spontaneously—i.e., without known association with external agencies.

The length of time which elapses from the beginning of tarring till real autonomous growth sets in shows great variation even in animals of the same species. In the mouse this interval may be as short as three months, or as much as 18 months, and in one experiment a mouse remained free from growth, although tar had been applied to the same area twice weekly for more than 18 months. The majority of mice, to social evolution, to general civilising influences—better education and the inculcation of greater self-respect, which such influences promote. There are, of course, many factors at work here; but in the forefront of civilising influences is the improvement of the home. So long as the public-house is more comfortable and more attractive than a man's home, the former will claim his leisure hours. Give him a comfortable and respectable home, and the lure of the public-house will automatically diminish. In the debate on Lady Astor's Bill, a few months ago, a good deal was said about the improvement of the public-house; but nobody suggested that, by devoting greater attention to the home, we might go a long way to improving the public-house out of existence altogether. Drunkenness stands in much the same relation to bad housing conditions as immorality and venereal disease, and, moreover, is admittedly a potent factor in the dissemination of the latter.

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[1] Read at the Cancer Congress at Strasbourg on July 23rd, 1923.

The Economics of the Abolition of Slum Areas.

In the foregoing remarks I have endeavoured to emphasise the relation of the special environmental factors of the slum areas—lack of fresh air and sunlight, and overcrowding—to four out of five of the great endemic scourges afflicting the community at the present time. I have said nothing of their relation to epidemic diseases, though there is no doubt that some of the latter are powerfully influenced by the same factors. For instance, pneumococcus lung infection is certainly a disease mainly of cities and crowded places, the infection spreading from pre-existing cases or healthy carriers. Observations in South Africa showed that natives who had recently arrived at the mines and occupied crowded compounds were most susceptible; and Gorgas, in a report upon pneumonia in the Rand mines, draws attention to the fact that there was the same high incidence among labourers in the Panama Canal zone, until they were removed from crowded compounds and encouraged to live in separate huts. The high mortality attending measles is probably attributable to similar conditions. Epidemic disease is, however, more elusive and less under control, and for that reason I have omitted it from argument.

If, then, I have submitted evidence that, by a determined attack upon our slum areas, there would be a reasonable expectation of making a beginning of the end of four out of five of our most formidable endemic diseases, the question is, Would it be worth while? Not as a sociological venture, or on humanitarian grounds, or as a moral obligation, on any of which there would be little difference of opinion; but "would it be worth while" as a business proposition? Because, however satisfying it may be to our consciences to prate of social and moral duties to our fellow men, when it comes to doing anything, and especially to spending taxpayers' and ratepayers' money, it is usually the business and economic aspect of any question which mostly counts. It is, therefore, from this point of view only that I approach it, and I omit all moral considerations. Besides, moral values cannot be assessed in pounds, shillings, and pence, though nobody would deny that they represent a very real asset.

In a paper read at the meeting in Glasgow last year entitled "The Economics of Public Health" Lieut.-Colonel Fremantle, consulting medical officer of health for the County of Herts, by a series of calculations, estimates the total direct material loss in England and Wales from sickness and disability at a minimum of £150,000,000 a year. From tubercle alone the estimated loss is £94,000,000 a year. In the United States of America, with a population three times as great as England and Wales, the estimated cost of sickness and death is £600,000,000 a year, of which at least one-third is considered preventable. Taking the cost to this country of sickness and disablement at £150,000,000 per annum, the country could spend without loss £50,000,000 annually, or, capitalised at 5 per cent., £1,000,000,000 on clearing the slum areas and securing better housing and living accommodation, provided that the cost of sickness and disablement were thereby reduced by one-third.

What actual sum would go to the credit side of the nation's health bill it is obviously impossible to determine. It would admittedly, therefore, be a speculation. But it would not be a bogus venture. An assured dividend of considerable amount is in sight. The improved physique of the nation; its better health; the diminution certainly, the extinction possibly, of such diseases as tuberculosis and rickets; the improved moral tone of the people, and the resultant diminution of venereal disease and its consequences; decrease in the consumption of alcohol with its disastrous effects on infantile and adult mortality, with the misery and moral degradation it brings to the home, with the loss of time, increase of industrial accidents and industrial inefficiency it entails—these and other items are the prospective dividend. Whether it would or not strike £50,000,000 off the annual health bill is the speculation. In this connexion I would remind the over-cautious and those averse to any kind of speculation or any degree of risk, that it is the speculators who have made this great empire—the men of courage and enterprise, men who have faced the uncertain and the unknown, and have not been afraid to take risks. And if we have not been afraid to speculate in adventure, in arms, in trade, and in business, why should we be afraid to speculate in health?

To face the risk would require a bold and imaginative statesmanship. It does not belong to the business outlook of the parish pump, only prepared to estimate in pounds, shillings, and pence the return on the capital expenditure. It would almost certainly eventually result in a real economy to the State. What we are doing now is to provide the breeding-ground for the mass production of disease with one hand, and with the other paying out millions of the taxpayers' and ratepayers' money to deal with the end-results of the very diseases we are fostering in our midst. It has been frequently said, the people make the slums. Such a pessimistic assumption would sound the death-knell of all progress. But it is nothing more than the comfortable argument of the man selfishly indifferent to the obligations of citizenship and regardless of his duty to the body-politic. It is flatly contradicted by the fact that through all the ages man, like every other living thing, has been the product, not the cause, of his environment. The slums make the people you find in them, and the only astonishing fact is that they can breed any other sort. It is a testimony to their physique and spirit and grit, no less than to the universal natural law of the survival of the fittest, that some of the inhabitants of the slums win through such an environment and escape the moral and physical ruin which engulfs those of weaker fibre.

The industrial revolution which occurred in the last century accounted for the urbanisation of our population, and the herding together of millions of workers in our industrial centres. This has been going on ever since. The early hour at which work commenced, the long working day, entire absence of rapid transport, or rather of any transport at all, necessitated their centralisation in the heart of our great towns, where land has consequently become of greater value than health. These conditions are reversed to-day. Powerful centrifugal forces have come into play, and have come to stay. The working day as a rule begins later, the hours are shorter, the day for half the year is longer owing to the Daylight Saving Act, and the means of rapid transport are available, and are becoming increasingly available every year. It has become, therefore, practicable in many instances for the worker to live further from his work—in other words, to move from the centre towards the periphery of our large towns, where land is cheaper and where it becomes, therefore, a business proposition to build on town-planning lines, and avoid the past errors of herding human beings together like sheep in a pen or pigs in a sty.

1

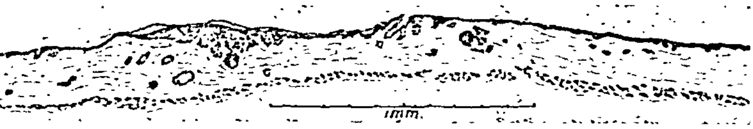

FIG. 1.—Slight proliferative changes at margin of tarred area of skin in a mouse which had spontaneous mammary carcinoma excised. Duration of tarring, 23 weeks.

2

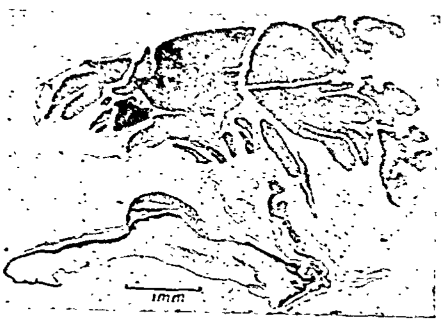

FIG. 2.—Absence of new growth in area tarred with ethereal extract in the mouse in which the alcoholic extract had produced the carcinoma shown in Fig. 3.

3

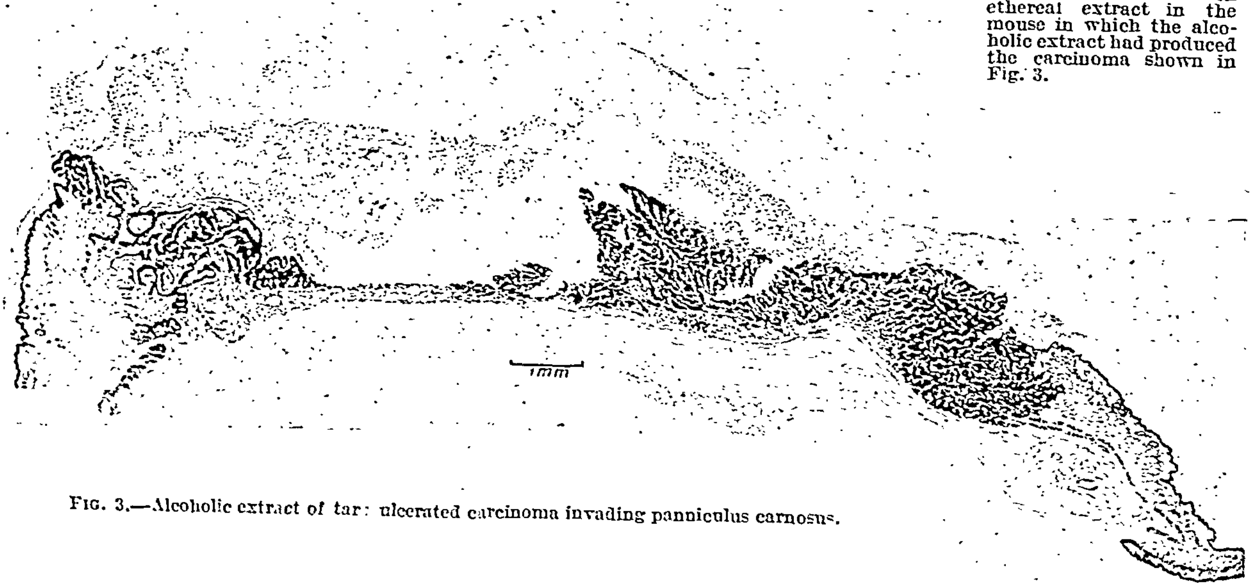

FIG. 3.—Alcoholic extract of tar: ulcerated carcinoma invading panniculus carnosus.

4

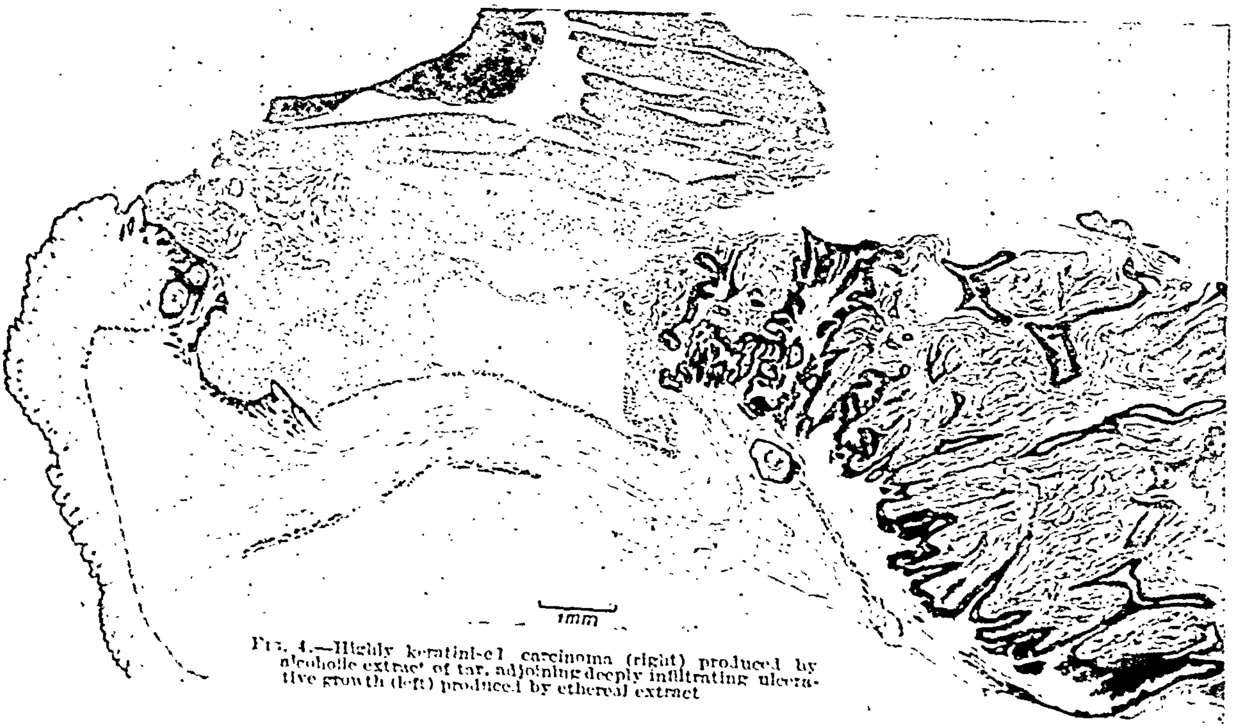

FIG. 4.—Highly keratinised carcinoma (right) produced by alcoholic extract of tar, adjoining deeply infiltrating ulcerative growth (left) produced by ethereal extract

however, develop skin carcinomata within six to nine months of tarring applied twice weekly. The extent of the area painted appears to have little influence. Very similar results have been obtained by painting the whole dorsal surface of the animal (Deelman), or an area of a square centimetre (Fibiger and Bang) or less (Murray and Woglom). The frequency of the applications, as might be expected, affects both the rapidity of induction and the percentage of success. Even a reduction from twice to once weekly prolongs considerably the interval necessary to produce cancer in mice, and the majority of workers have made their applications on alternate days or three times a week.

An interesting question is whether there is an upper limit to the intensity of the stimulation which may be followed by cancer production. In an experiment on rabbits in this laboratory it was found that bi-weekly applications of ethereal extract of tar to a small area on the nape of the neck produced highly inflamed and painful excoriations within a month. The applications were discontinued for two to three weeks, and then begun again, but only once weekly. The irritative phenomena did not recur, but after six to eight months from the beginning of the experiment—two rabbits out of 15 showed localised progressive lesions which continued after painting was stopped, and proved to be typical squamous-cell carcinomata when examined microscopically after excision. When it is remembered that Yamagiwa and Ichikawa had to persevere for two years to produce carcinoma of the rabbit's ear and that neither Fibiger nor Leitch (personal communications) have obtained progressive autonomous growths after the same length of time in the same species, the suspicion seems justified that the success in this experiment was in part due to the less severe and more widely spaced stimulation. As pointing in the same direction, it may be mentioned that cancer has never been observed in the workers in chromic acid factories, in whom chronic ulcerations, known as chrome sores, are common. Then again, X ray cancer has rarely supervened at the site of X ray burns and never after radium burns, but rather in areas subjected repeatedly to slight amounts of irradiation. Contrast also the occurrence of carcinoma of the skin in locomotive engine-drivers exposed to the irradiation from the open fire-box with the fact that the much more intense stimulation of the finger-tips by pipe-smokers in pressing down the glowing tobacco is apparently never followed by cancer.

According to Deelman, the association of another kind of injury with tarring results in a shortening of the time necessary to produce cancer. Deelman scarified the dorsal surface of mice immediately before tarring. The treatment was carried out on alternate days for a week and then tarred without scarification thrice weekly for one month. Papillomatous new growths, going on to malignant new growth, supervened after five to eight weeks after the beginning of the experiment—i.e., roughly one-quarter of the time necessary without scarification. Deelman considers that scarification merely permits a more intimate application of the tar to the deeper layers of the skin, but the following observations suggest that a more fundamental significance should be attributed to it. When the area scarified and tarred is small the time of cancer production is not shortened in anything like the proportion obtained by Deelman. It is also significant that he found that repetition of scarification after the first week did not further accelerate the onset of neoplastic change. It is as if the trauma, and the reparative changes following it, had put the cells in a more receptive condition for the carcinogenetic action of the tar.

The relation of trauma to the induction of new growth is further illuminated by the work of Drew on the mechanism of repair by the method of tissue culture. It has been known for a long time that actively growing embryonic tissues, and tumours also, proliferate immediately when placed in a suitable medium outside the body. The quiescent tissues of the young or adult animal, on the other hand, do not begin to grow till after the lapse of an interval more or less prolonged. Thus, Drew found that heart or kidney of the rat may lie dormant for from 10 to 14 days in a medium in which the corresponding embryonic tissues, and tumours, would have shown vigorous growth in 24 to 48 hours. When a filtered saline extract of disintegrated rat kidney which has been incubated at 37° C. for two to four hours is added to the culture-medium, adult tissues begin growing at once and in 48 hours spread out on the cover-glass in a sheet of healthy dividing cells. The initial delay has been eliminated. If the disintegrated kidney instead of being incubated is maintained at 0° C. for two hours and then filtered off, the fluid is devoid of this actively stimulating property. When a corresponding cold extract is prepared from a rapidly growing transplantable carcinoma or sarcoma of the mouse it is found to be as rich as, or richer than the extract of incubated damaged normal tissue, in the activating substances. From these observations, many times repeated and always with the same result, it is concluded that these malignant growths produce continuously of their own accord growth-stimulating substances which normal tissues only elaborate in response to cell damage. A direct relation exists between the growth-stimulating power of the tumour extracts and the rate of growth of the tumour used to prepare it. This suggests strongly that the biochemical mechanism by which their proliferation is maintained is, at any rate in part, by the elaboration of this growth-activating substance or substances. It is not desirable to attempt, at the present stage of these investigations, a speculative development of this conception of the nature of neoplastic proliferation further than to point out how well it accords with the additive effect of trauma in accelerating carcinogenesis as shown by Deelman. A certain amount of activating substance is probably produced by any kind of cell damage, and when by constant repetition this production has become automatic, proliferation will continue after removal of the cause of protoplasmic disintegration. Temporary hypertrophies would, in this conception, correspond to the purely reactive production of activator, ceasing when the irritant is removed, benign growth to an autonomous production in small amount, and malignant growth to a more abundant production.

In the past one has been accustomed to regard the preparatory period of chronic irritation which precedes the development of cancer as occupied in a gradual cumulative removal of resistance on the part of the organism to the unrestricted powers of growth of its constituent cells. This resistance, variously designated by inhibition, internal tissue tension, and similar fantastic expressions, was regarded as holding the tissues in check. The preceding discussion leads to a somewhat different conception—viz., that in cancer the cell acquires new properties, exploitations, if you will, of the normal cell activities, but acting in a new way with disastrous consequences to the organism.

Two other features of the development of cancer under experimental conditions bear on this conception of the secondary character of the neoplastic transformation. The first is the discrete focal character of the process. Growth begins in isolated, usually minute, areas and not diffusely throughout the whole zone of application of tar. The second is the existence of a latent period, very little affected by continuation of the irritant as indicated by Deelman's work and emerging clearly from the deliberate experiments of Leitch and of Bang. These authors working independently stopped the application after two, three, or more months in animals which had shown no proliferative changes or only slight hyperplasias, and found cancer appearing after a further interval at the treated site. In several instances the local hyperplasia had regressed and the skin had become smooth and the new growth started in the otherwise normal hairless area.

experiment, admittedly difficult to interpret, gives indications of a mutual influence of approximately contemporaneous tumours, by which their full cancerous development is retarded for a time or permanently. The other experiments show that the induction of a fresh primary growth after a first has been definitely established meets with a very intense resistance, whether the first tumour be of the same parent tissue or another. The nature of this secondary refractoriness to the induction of cancer is obscure. It is not a resistance to growth, as is shown by the occurrence of metastases and the success of autoplasty. It is apparently an inability to react with cancerous proliferation to procedures which initiate it with certainty in normal animals. Nor has it anything in common with the well-known acquired resistance to the growth of transplantable tumours. Fibiger has produced experimental tar cancer in such resistant animals, and the development spontaneously of mammary carcinoma has also been recorded in these so-called "immunes."

The nature of this refractory state must be the subject of further investigation. The rarity of multiple primary malignant new growths in the same individual finds a rational explanation by it. Its greatest interest and importance, however, lies in the indication it gives of a systemic, constitutional change in the organism in which cancer has developed, a change which, if it could be recognised with certainty and rapidity, would enable us to recognise cancer in its earliest stages, and could we produce it without initiating new growth, would place in our hands a rational means of prevention.

THE IMMEDIATE PROGNOSIS IN NEPHRITIS,

WITH SOME REMARKS ON URÆMIA.

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WITH the increasing application of chemical methods to the study of the disease, the accuracy of our prognosis in nephritis has made a considerable advance. The bulk of modern work has centred round the question of the retention of the nitrogenous waste products in the blood, and has more especially concentrated on the content of the blood in urea, on account of the ease and accuracy with which this substance can be estimated. There can be no doubt, however, that an estimation of the urea content of the blood in cases of severe azotæmic nephritis does not necessarily settle the question of the immediate prognosis. A blood-urea content as high as 300, or even, in rare instances, 400 mg. per 100 c.cm., is not incompatible with recovery in an acute case, and even in chronic types of nephritis, in which the capacity for recovery is of necessity less, a blood-urea content of 100 to 200 mg. does not necessarily imply a speedy death. A confident prognosis can therefore scarcely be ventured upon from an estimation of the blood-urea alone, and several estimations at intervals of some days may be necessary before an opinion on the immediate outlook can be given.

That this difficulty does actually exist in practice is shown by the stress laid by certain American authors on the creatinine content of the blood. Creatinine is assumed by these workers to be more readily excreted by the kidney than either uric acid or urea, and is, therefore, the last of the nitrogenous waste products to accumulate in the blood. On this assumption, any marked creatinine accumulation is to be regarded as indicative of very severe renal functional impairment, and of the terminal stage of the disease. The whole question of the accuracy of the creatinine estimation has, however, been reopened by Benedict,[1] who has even gone to the length of suggesting that practically no creatinine is present in the blood, though he believes that the estimation of the substance, whose chromogenic reactions have led to its confusion with creatinine, is still of value. Folin,[2] also, has come to the conclusion that the retention of the various nitrogenous waste products in the azotæmic type of nephritis proceeds pari passu, and that the suggested delayed retention of creatinine does not actually occur.

A plea may therefore be entered for the value of a determination of the plasma content in inorganic phosphorus (phosphate) in estimating the probable outcome of a case of azotæmic nephritis. The phosphate estimation by the method of Bell and Doisy,[3] as modified by Lehmann, is simple, rapid, and apparently accurate; and, while there is no evidence that the nitrogenous waste products exert any toxic influence upon the organism, phosphate retention is associated with certain definite chemical changes in the blood, which are apparently of importance in the symptomatology of uræmia. The retention of the nitrogenous waste products is a useful guide to the degree of renal damage present, but in itself is apparently harmless; phosphatic retention, on the other hand, appears to involve certain deleterious results.

Though retention of phosphates is undoubtedly associated with impairment of nitrogenous excretion, and though, when a series of cases is averaged, it is found that the rise in the plasma phosphate closely corresponds to the degree of urea retention, in individual cases marked differences in the degree of retention of the two bodies occur. Thus we may find a high blood-urea with a relatively low plasma phosphate content, and conversely. The cause of these differences in the degree of retention of the two bodies is uncertain; the available evidence would appear to suggest that they are the results not so much of variations in excretion as of variations in the diet, and in the demand for phosphorus and nitrogen for anabolic purposes.

Value of Estimation of Inorganic Phosphorus.

The value of the estimation of the inorganic phosphorus in prognosis is illustrated in Table I., in which the figures for blood-urea and plasma phosphorus in 53 consecutive cases of nephritis are tabulated. Where a series of estimations have been made in a patient, the highest figures obtained for the urea and phosphorus are given. In all the fatal cases death resulted from true uræmia. Two cases of nephritis, in which the disease was complicated by peritonitis and by portal pyæmia, and which terminated fatally, have been omitted; in both of these the plasma phosphate content showed no appreciable rise. The normal inorganic phosphorus amounts to between 2 and 4 mg. per 100 c.cm. of plasma.

TABLE I.—*Blood-urea and Plasma Phosphorus in 53 Consecutive Cases of Nephritis.*

Blood-urea mg. per 100 c.cm.	Cases.	Deaths.	Plasma phosphates as mg. P per 100 c.cm.	Cases.	Deaths.
400–566	6	6	10–22	12	12
300–400	3	2	8–9	2	1
200–300	4	3	7–8	2	—
100–200	7	2	6–7	2	—
50–100	7	—	5–6	7	—
Below 50	26	—	Below 5	28	—

The number of fatal cases is small, but the conclusion as to the prognostic value of the phosphate estimation appears to be justified. A sharper line separates the fatal from the non-fatal cases from the standpoint of the plasma phosphorus than from the standpoint of the blood-urea. It is not, of course, suggested that a plasma inorganic phosphorus content exceeding 10 mg. per 100 c.cm. *invariably* implies a speedy death, but merely that as regards the immediate prognosis the degree of phosphate retention is a better guide than the degree of urea retention.

II.—SECONDARY RESISTANCE TO CANCER PRODUCTION.

The strict localisation of experimental tar cancer to the area painted would lead one to expect that subsequent tarring of another area remote from the first would again result in the production of a fresh primary growth at the new site. As a rule, experiments of this kind end prematurely by the death of the animal from intercurrent disease or from metastasis in internal organs from the first primary growth. For this reason, although these attempts have been carried out for more than two years in more than 50 mice in which experimental tar cancer had been produced, the number in which the second tarring was at all commensurate in duration with the first is still very small. Table I. gives the duration of the first tarring, the interval between the two series of applications, and the duration of the second tarring.

TABLE I.

Identification number.	Duration of first tarring.	Interval.	Duration of second tarring.
1577	25 weeks	36 weeks	24 weeks
1632	58 ,,	8 ,,	25 ,,
1717	28 ,,	12 ,,	29 ,,

In none of these mice was there any indication of proliferative changes at the secondary site. The hair fell out in the treated area and the skin was found to be atrophic when it was examined in sections. Taken by themselves these observations are without significance, except incidentally for the doubt they throw on the presumed predisposing action of age as increasing the liability to cancer, if no other factor be assumed to operate. The result of a similar trial in mice with spontaneous mammary cancer, however, increases the probability that these negative results are not fortuitous, but due to a real unsusceptibility of the animals to the carcinogenetic action of tar. Table II. gives the duration of the tarring of mice in which spontaneous mammary carcinoma had been removed by operation.

TABLE II.

A = Identification number. B = Duration of tarring in weeks.

A		B	A		B	A		B
1595	....	20	1649	....	20	1758	....	14 S
1601	....	23	1655	....	21	1760	....	25 S
1620	....	22	1737	....	37 S	1777	....	11 S
1635	....	17	1755	....	18 S	1787	....	8 S
1641	....	24	1757	....	9			

Result.—No. 1755: Metastases in lungs. No. 1787: Papilloma growing progressively after cessation.

S = *Scarification (see context).*

In those marked "S" in the column giving the duration of tarring, scarification was combined with the application of tar either for the whole or part of the time. The result after eight weeks in mouse No. 1787 is taken to indicate that the failure to produce any proliferative changes was not due to insufficient duration or intensity of the applications, but indicates a real inability of these animals to respond to this stimulation, carcinogenic for normal animals. (See Fig. 1.)

Another experiment was carried out to see how long the first stimulation must precede the second in order to prevent the development of cancer from the latter. This experiment is still in progress and only the first provisional results in six mice out of 50 tested are available. These 50 mice were painted twice weekly on the left shoulder with the ethereal extract of tar with which most of these experiments have been performed. Seven weeks after the beginning of the tarring, applications were begun on the right flank, unaltered hairy skin intervening between the two areas. The result up to the present is shown in Diagram A.

In two mice carcinomata have developed at both sites and practically simultaneously. In the other four no growth has been produced at the second site, although in all but one which died early, tarring has been kept up for a period, as long as, or longer than, was necessary in the first instance.

Some of the peculiarities in the results of another experiment, planned originally to show the relative carcinogenic efficacy of the alcohol soluble, and of the ether soluble fractions of tar in comparison with the unaltered whole tar, bear out this conclusion of a general systemic effect of the development of one primary growth, on the liability of the animal to develop another primary growth. The experiment was begun before this possibility had been suspected. Unaltered whole tar, alcoholic extract, and ethereal extract of tar were applied simultaneously to separate areas of the dorsal skin of 60 normal mice. After four months, when the first tumour appeared, 50 mice survived, and in these 25 presented malignant new growths distributed as follows:—

DIAGRAM A.

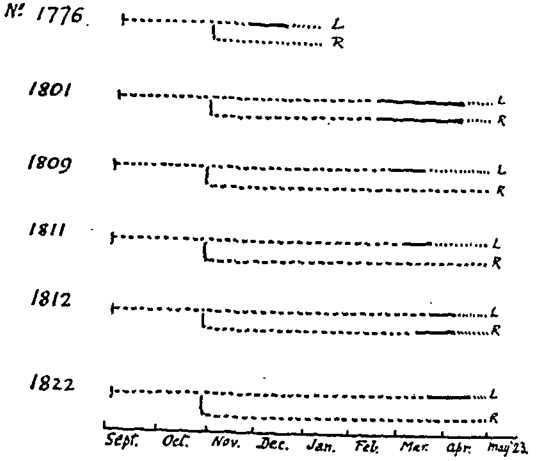

Diagram showing development of carcinomata in six mice painted twice weekly on left shoulder with ethereal extract of tar, and seven weeks later also painted on right flank.

TABLE III.

No. of mice.		Tar.		Alcoholic extract.		Ethereal extract.	
11	....	−	....	−	....	+	22
10	....	+	....	−	....	+	
1	....	−	....	+	....	+	
2	....	+	....	−	....	−	
1	....	−	....	+	....	−	
25							

Twenty-two out of 25 animals bore carcinomata at the site painted with the ethereal extract and in 11 of these no tumours developed at the other sites painted. Twelve had carcinomata at the site treated with the original tar, and of these ten had growths at the area treated with ethereal extract, two only having no tumours elsewhere. Only two mice developed tumours at the site painted with the alcoholic extract. In one of these (No. 1710, Fig. 4) the ethereal extract also produced a tumour. In the other, only a slight warty thickening appeared at the site treated with the ethereal extract. (Figs. 2 and 3.) While the ethereal extract is definitely more certain, it is not more speedy in its action than unaltered tar. Both preparations are more active than the alcoholic extract and yet the latter in one mouse alone gave rise to a carcinoma. (Figs. 2 and 3.)

This experiment shows that when several substances of different carcinogenic power are applied simultaneously to separate areas of skin, the result cannot be predicted with certainty from a knowledge of their respective strengths. The relatively weaker whole tar may inhibit for a time the development of the tumour produced by the more active ethereal extract. In one mouse the very much less efficient alcoholic extract had produced a tumour which grew progressively, while the ethereal extract lesion remained stationary. Taken in conjunction with the results of the retarring of tumour mice already described, this typical of true uræmia are absent, and in contrast with the latter condition the prognosis in both eclamptic and nephritic types is good, provided that death does not result from the convulsions. The ultimate renal recovery is, as a rule, complete. The whole root of the matter would appear to lie in the cause of the raised blood pressure in the pseudo-uræmic cases, and of this no satisfactory explanation can as yet be given. The rapid changes in the height of the blood pressure appear to preclude anatomical changes in the vessel walls as a factor; the influence of the hydræmic plethora is doubtful, since marked hydræmia does not necessarily involve a rise in the systolic pressure; the most plausible explanation would appear to lie in the presence of some as yet undetermined pressor substance in the circulation, but such an explanation is at present mere hypothesis. It must even be admitted that we have, as yet, no definite evidence that the renal lesion in these cases is primary. The reported occurrence of a rise of blood pressure in the eclamptic type of pregnancy toxæmia before albumin appears in the urine is of interest in this connexion.

Lastly, in subacute nephritis the two types of uræmia may coexist, and this fact has, in the past, led to considerable confusion. In such cases a raised blood pressure, hydræmia, and convulsions are combined with retention of nitrogenous waste products and phosphates, and with depletion of the plasma bicarbonate and serum calcium. In such cases the prognosis is of the worst. The condition can only be distinguished from eclamptic pseudo-uræmia by the chemical examination of the blood, which at once reveals the true condition of affairs.

For the sake of clarity, the findings in the three conditions are summarised in Table III.

TABLE III.—*Findings in Three Types of Uræmia.*

	Blood	Plasma.		Serum.		B.P.
—	Urea mg. per 100 c.cm.	Phosphates as mg. P per 100 c.cm.	CO_2 vols. per 100 c.cm.	Calcium mg. per 100 c.cm.	Solids per cent.	Systolic.
Normal	20–30	2–4	60–70	9·6–10·6	9–10	120–130
True uræmia	550	18	24	5·5	9·5	124
Pseudo-uræmia ..	30	3·7	56	9·4	7·1	190
Mixed uræmia ..	270	15	30	6·0	7·5	180

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SECONDARY ANÆMIA IN INFANCY:

A RECORD OF SOME CLINICAL OBSERVATIONS.

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SECONDARY anæmia has long been recognised as of common occurrence in infancy, and undoubtedly results from many and diverse causes. The present article is concerned with the condition seen in a group of infants otherwise in good or fairly good health, who were receiving a diet consisting chiefly of cow's milk, with or without heavy carbohydrate additions.

Milk Diet as a Cause of Anæmia in Infants.

Anæmia in subjects on such diets has been frequently described, but opinion as to its cause and symptomatology shows wide variation. Milk contains an extremely small amount of iron, a quantity insufficient for the needs of the growing infant (Morse and Talbot[1]), and the amount present in cow's milk is probably even less than that in human milk (Finkelstein[2]). The percentage of iron retained is apparently less in a baby fed on cow's milk or goat's milk than in one fed on human milk (Krasnogorski[3] and Blauberg[4]), so that the amount of iron obtained from a milk diet by a bottle-fed baby does not nearly suffice to meet its needs. Bunge[5] has shown that there is in the liver of young animals at birth a store of iron, which makes good this deficiency in milk during the period of lactation, and that this store diminishes progressively in amount during the time of milk feeding. In the infant it has been demonstrated that two-thirds of this store of iron is deposited during the last three months of intra-uterine life, so that a premature infant is born with a small store of iron, though the percentage per kilo body weight is approximately the same as in the full-term child (Hugouenq[6]). Premature infants are specially liable to anæmia, and some authors have held that every premature infant fed exclusively on milk becomes anæmic, as it is born before a sufficient amount of iron has been accumulated in the liver (Schultness[7]). Many workers claim excellent results from the administration of inorganic iron salts by mouth in this condition. Schwarz and Rosenthal,[8] for instance, say that they are able to bring about an increase of 20–30 per cent. hæmoglobin in a few weeks by the administration of iron alone. The majority of writers (e.g., Schultness,[7] Finkelstein[2]), however, advise a restriction of the quantity of milk in the diet and more mixed feeding besides treatment with iron salts. Most of the French authors (e.g., Hallé and Jolly,[9] Leenhardt[10]) consider that the type of anæmia produced in infants by an insufficiency of iron in the diet resembles chlorosis as seen in young adults, and have called it the "chlorotic type" of anæmia in young children.

Certain German authors have differed entirely from these views. Kleinschmidt,[11] after an exhaustive summary of the literature and an examination of his own cases, arrived at the conclusion that the condition resulting from a one-sided milk dietary, which he terms "alimentary anæmia," presents a very varied picture. There are all gradations in the blood between the "chlorotic type" (showing a normal number or slight reduction of red cells, with a diminution in the percentage of hæmoglobin and little other change in the blood) and cases of well-marked von Jaksch's anæmia, with the profound changes in the blood together with the large hard spleen associated with this disease. He, like Czerny, does not favour the administration of iron salts. Both hold that excessive milk consumption plays an important part in anæmia in infants. Czerny believes that the saponification of a large amount of milk fat causes diminution in the alkaline reserve, and Kleinschmidt, while admitting that this view is not yet proved, is nevertheless of opinion that the anæmia is due to some toxic effect produced by the milk in the food. Both successfully treated the condition by greatly reducing the quantities of milk, replacing it by vegetables, cereals, fruit, and, if possible, meat, but very little fat. Kleinschmidt recognises, however, that such a diet contains much more iron than a milk dietary. He holds that "alimentary anæmia" occasionally results from excessive carbohydrate feeding, and attributes this also to a toxic effect. He does not think that anæmia invariably develops from a long-continued and exclusive milk dietary, but believes that its development is favoured by constitutional abnormalities and debility. In a recent publication from the Johns Hopkins Hospital, Evans and Happ[12] set forth evidence in favour of the view that secondary anæmia in infancy from a single cause may lead to a variety of blood pictures, the grade of change depending on the degree of strain thrown upon the blood-forming mechanism. So that they agree with Kleinschmidt that there is no clear line of demarcation between the "chlorotic type" of anæmia of infancy

As an illustration of this, Table II. gives the parallel figures for a small number of fatal and non-fatal cases.

TABLE II.—*Blood-urea and Plasma Phosphorus in 5 Fatal and 5 Non-fatal Cases.*

Fatal.			Non-fatal.	
Urea.	Plasma P.	Length of survival in days.	Urea.	Plasma P.
269	17·5	3	150	5·0
171	15·1	7	196	7·0
198	14·2	3	223	5·6
238	11·6	4	167	6·7
429	12·0	2	267	8·8

Apart from the question of the immediate prognosis, phosphate retention is apparently more definitely connected with the symptoms of true uræmia than is the retention of urea. Cases are occasionally encountered in whom both phosphate and urea retention are present, and in whom the plasma phosphate shows a temporary fall without a corresponding drop in the blood-urea. Under such conditions the symptoms of uræmia may largely disappear during the period of the phosphate fall, in spite of the persistence of a high blood-urea content. Though the weight of experimental evidence would appear to be against the existence of a definitely toxic action of the phosphate ion, its increase in the blood is associated with certain changes in the chemical composition of that fluid which are probably of importance to the organism. The first of these is a reduction in the bicarbonate content of the plasma, often extreme and proportionate to the increase in the plasma phosphate[4]; the second, possibly of more significance, is a reduction of the serum calcium. In the present series the lowest calcium content observed was 5·1 mg. per 100 c.cm. of serum, or about half the normal. The calcium decrease was, on the average, proportional to the increase in the phosphate content of the plasma, and is probably the result of that increase, since experimentally injections of orthophosphoric acid or of phosphates are followed by a decrease in the calcium of the serum. Of ten fatal cases, in which the calcium was estimated, the serum contained less than 7 mg. per 100 c.cm. in nine.

Differentiation of Types of Uræmia.

There can be no doubt that the lines of differentiation between the various types of uræmia originally laid down by Volhard[5] still hold good, though recent investigations have added considerably to our knowledge of the chemical changes present. Volhard distinguished true uræmia from the eclamptic pseudo-uræmia which is seen in acute and subacute diffuse nephritis and also in eclampsia. The symptoms which he regarded as typical of true uræmia are, in brief, weakness and wasting, gastro-intestinal disturbances, liability to infection, motor hyperexcitability, and hyperpnœa. The gastro-intestinal symptoms are not infrequently the only sign of the presence of the disease until the terminal stages are reached. Death occurs from cardiac failure after a period of coma of variable duration. True uræmia is frequently a singularly undramatic condition, and is, in many instances, indistinguishable from the so-called latent uræmia which follows bilateral calculus suppression, or cortical necrosis of the kidneys. There is, in fact, no good reason for distinguishing two conditions which clinically and chemically appear to be identical. As Volhard pointed out, an essential feature of the condition is nitrogenous retention, and to this we can now add phosphate retention, diminution in the plasma bicarbonate, and a fall in the calcium content of the serum. The hyperpnœa may reasonably be ascribed to the acidosis which results from phosphate retention; it is continuous and not paroxysmal, resembling the hyperpnœa of diabetic coma. The characteristic localised muscular twitchings or tremor, which are a sign of grave prognostic import, appear to be associated with the diminution in the serum calcium. Theoretically such a diminution should result in increased nervous irritability, and in my own experience those cases in which the calcium fall has been most pronounced have shown this symptom in its most marked form. The blood pressure may be raised, but in a considerable proportion of the patients lies within normal limits; in the present series a case of chronic nephritis, showing a blood-urea content of 561 mg. per 100 c.cm., gave a systolic reading of 124 mm. Hg, while in another patient who gave a history of renal disease of four years' standing, and in whom the blood-urea reached a figure of 269 mg., the systolic blood pressure was 118 mm. Hg. This absence of any correlation between nitrogenous retention and a raised blood pressure is now well recognised, and it has been shown that attempts to raise the blood pressure in the azotæmic type of nephritis by high protein feeding are without result.

The actual cause of death in this type of uræmia remains unknown. The available evidence is against any toxic action of the accumulated nitrogenous waste products, nor has it been satisfactorily proved that the phosphate ion is in itself poisonous to the organism. The effect of the depleted plasma bicarbonate with the resulting tendency to an uncompensated acidosis is uncertain; the administration of sodium bicarbonate and correction of the deficit in the alkaline reserve of the plasma has, however, as in diabetic coma, no definitely beneficial result. It is possible that the ultimate cardiac failure may be associated with the fall in the serum calcium.

In eclamptic pseudo-uræmia, on the other hand, the symptoms are more striking, but the prognosis is relatively good. The most prominent symptoms—headache, vomiting, slow pulse, and generalised convulsions—are apparently of cerebral origin. In some cases temporary amaurosis occurs, and the patient may lapse into coma without preceding convulsions. The symptoms of the condition, whether occurring in connexion with acute nephritis or with true eclampsia, are the same. The chemical examination reveals few abnormalities. The blood is dilute, the percentage of serum solids being considerably less than normal, a condition which is not necessarily present in true uræmia; some degree of chloride and water retention can be shown to be present by balance experiments, and œdema, often slight in degree, is present in all cases. In contra-distinction to true uræmia, the blood-urea content is not appreciably increased, and phosphate retention is absent; the alkaline reserve of the plasma, if estimated before the occurrence of the convulsions, shows no definite diminution. The serum-calcium content, at any rate in cases of true eclampsia, may be at a practically normal level; in six eclamptic patients whom I have had the opportunity of examining the calcium has ranged from 8 to 9·4 mg. per 100 c.cm. of serum. Localised muscular twitchings are absent and the nervous symptoms are cortical rather than peripheral.

The most probable explanation of the chief symptoms of the condition would still appear to be the original suggestion of Volhard, who ascribed the symptoms of pseudo-uræmia to an increased intercranial pressure associated with the raised blood pressure and œdema. On lumbar puncture the intrathecal pressure is abnormally high, the convulsions are frequently preceded by a rise in the blood pressure, and, when once the blood pressure shows a definite fall, no further fits need be anticipated. The chief objection to this theory of pseudo-uræmia lies in the fact that cases of true eclampsia are said to occur without any definite rise in the blood pressure. Further investigation of this point is highly desirable. Briefly, eclamptic pseudo-uræmia is characterised by cerebral symptoms, in association with some degree of retention of water and chlorides and a raised blood pressure; nitrogenous and phosphate retention and the other chemical changes a good response with increase of 14–38 per cent. of hæmoglobin, and were discharged with 64–77 per cent. of hæmoglobin. Improvement was not noted in any case until 3–4 weeks after treatment was begun, and in one case in which the percentage of hæmoglobin increased from 49–71 per cent. in 2¾ months no improvement was noted in the first six weeks of treatment. It is clear, therefore, that to give iron treatment a fair trial one must persist with it for a number of weeks. Of the remaining five cases, three showed an increase of hæmoglobin of 6–10 per cent., and were improving at the time of discharge, and two showed no improvement after 1½–1¾ months' treatment. Several of these five had been handicapped during the period of treatment by other causes. one had an operation for the removal of tonsils and adenoids, one had a pyrexial attack with tonsillitis and otorrhœa, and one was suffering from an X ray burn—the result of a previous unsuccessful attempt to treat the anæmia by radiation of the spleen. If the period of treatment had been longer, there is little doubt that further improvement could have been obtained in the majority of cases. Finkelstein[2] holds that at least three months' treatment should be given in every case, and says that there is no improvement in the hæmoglobin percentage in the first few weeks after the beginning of a course of iron treatment. None of the cases under consideration was treated by a reduction of the quantity of milk in the diet, so that no opinion can be offered as to this method of treatment. But the advocates of strictly dietetic treatment state that the complete change in diet is usually accompanied by a loss of weight, and often results in a refusal of food and a digestive upset (Kleinschmidt[11]), so that if the same object can be attained by the administration of iron without any untoward effects, there is no doubt that the latter would be the treatment to be preferred.

Prophylaxis.

More important than the question of treatment is that of prevention. The evidence available, in the opinion of the author, strongly supports the view that the anæmia is the result, in part at least, of iron starvation, but what other factor or factors play a part in its production is as yet uncertain. Milk contains very little iron; the infant is dependent on the store in its liver, and it has been shown that this store is very low by the end of the normal period of lactation (Bunge[5]). Thus, if the store is used too quickly, the child may well suffer from an insufficiency of iron during the first year of life, and this is likely to happen in an infant fed from an early age on cow's milk on account of the smaller percentage retention of iron in an artificially-fed child.

Attempts to produce anæmia in young animals by giving diets containing insufficient iron have not given consistent results (Kleinschmidt,[11] Hausermann,[12] Schmidt[13]), but have usually resulted in marked anæmia. In view of the recent advances in the technique of dietetic experiments on animals, much of the work of earlier writers appears now of lessened value, but the recent work of Happ[14] on young rats indicates that a diet containing insufficient iron (or for that matter a diet of cow's milk or cow's milk and bread) will not produce anæmia in these animals in the first generation, but that it may occur in the second generation. Possibly, therefore, an insufficiency of iron is only one factor producing "alimentary anæmia" in infants. Nevertheless, if iron starvation plays a part in such anæmias, the question of how the deficiency of iron in the diet is to be supplemented, and from what age this should be done, requires consideration. Finkelstein advocates the administration of fruit juice and vegetables from an early age—to premature infants from 4–5 months of age—but states that such a diet will not necessarily prevent anæmia in premature babies. Kleinschmidt is emphatic that mere supplementing of a milk diet with vegetables without marked reduction in the quantity of milk will not cure the anæmia. Small daily rations of vegetables given to many of the children at the Meidling Hospital from the age of 6 or 7 months did not prevent anæmia, and the giving of eggs to older babies appeared to have no beneficial effect on the amount of hæmoglobin. No evidence was obtained as to whether or not supplementing the milk dietary with any other foodstuff, for instance gravy or meat juice, would have proved prophylactic. In any case, it seems highly desirable that the question of prophylaxis should be further studied, and this the author hopes to have the opportunity of doing in the near future.

Most medical officers in charge of infant welfare centres must have been struck by the number of pale-faced babies attending. What proportion of these are truly anæmic can only be ascertained by examination of the blood, but the number must often be large. No doubt many of these anæmias are not primarily dietetic in origin, but if, as seems probable, one frequent cause is iron starvation, it would appear advisable to administer some form of iron salts as a drug to all such cases at an early stage, whether or not other treatment is given.

Summary.

1. There is a general consensus of opinion that too prolonged and too exclusive a milk dietary produces anæmia in infants and young children. This is probably due in part at least to iron starvation, on account of the low iron content of milk. Some writers, however, have held that it is directly connected with a toxic effect resulting from excessive milk consumption. Premature infants are known to be particularly liable to this form of anæmia.

2. In a group of 36 artificially-fed infants, receiving milk or milk and carbohydrate diets, with or without cod-liver oil, the majority developed anæmia. It was usually noted towards the end of the first year of life, but sometimes appeared as early as the seventh month. Additions of vegetables to the diet from 6 or 7 months old did not prevent anæmia. The infants were in well-lighted and well-ventilated wards, and were much out of doors in summer but very little in winter.

3. Treatment by the administration of inorganic iron salts by mouth brought about improvement in the majority of cases treated, but not in all, possibly because treatment was not continued for a sufficient length of time.

4. No improvement was noted in the hæmoglobin content of the blood in any case within three to four weeks from the beginning of treatment, and improvement might be delayed for six weeks with, thereafter, rapid progress.

5. It is suggested that many cases of anæmia in infants, particularly in those artificially fed from an early age, are probably associated with iron starvation, more especially as it has been experimentally demonstrated that the iron retention of an infant on cow's or goat's milk is much lower than on human milk.

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of the French writers and other forms of secondary anæmia, among which they include splenic anæmia of infancy (von Jaksch's anæmia). It is clear, therefore, that opinions have differed greatly as to the cause, symptomatology, and treatment of anæmia occurring in infants given an exclusive milk dietary.

The Normal Blood Count in Infancy.

Different authorities, moreover, are not agreed concerning the normal blood count in infancy, especially with regard to the percentage of hæmoglobin. Holt's figures[13] for infancy represent views commonly held. Exclusive of the first few days of life, they are: Hæmoglobin, 65–85 per cent. ("75 per cent. a low limit in healthy children"); red blood corpuscles, 4–5½ million per c.mm.; white blood corpuscles, 9000–18,000 per c.mm. Finkelstein[2] puts the lower limit of hæmoglobin at 65 per cent.; Kleinschmidt[11] explains the differences of opinion concerning the range of the normal hæmoglobin percentage in infancy as largely due to the differing standard colour tubes used. It would seem that such a figure as 55 per cent. for the lower limit of normal (Aschenheim) must be due to the use of a standard colour tube differing considerably from those used by most workers. Many authorities place the normal red-cell count higher than does Holt—i.e., at 5 million or more per c.mm. (Kleinschmidt[11]).

Personal Observations.

The following observations are published because they demonstrate the extreme frequency of anæmia on cow's milk diets in a group of children living under excellent hygienic conditions. The results came as a surprise to me, and may, perhaps, be of use to others. The observations were made at the Meidling Hospital, Vienna, an institution under the charge of Dr. Egon Rach, and under the direction of Prof. Pirquet, head of the University Kinderklinik. The infants were admitted for an investigation concerned with the prophylaxis and cure of infantile rickets.*

(1) *Diets and Hygienic Condition.*—Two types of diet were in use. One was that in general use in the institution. It consisted of cow's milk with heavy carbohydrate additions. An infant until about 5 months of age was given full milk with the addition of 8·5–20 per cent. of cane sugar. From about 5 months old it received also increasing amounts of cereal, and at about 6 or 7 months small amounts of vegetable purée, usually potato, sometimes carrots or spinach. Fruit purée was usually given at about 8 months, biscuits about 9 months, bread between 9 and 12 months, and butter not till after 12 months. Eggs were given to a few of the older children. The total calorie allowance was high, and the amount of milk consumed daily at 5 months of age was usually over 1 pint. For older infants it was not less than this amount, and was usually nearer 1½ pints.

The other type of diet was a more exclusive milk dietary, so that larger quantities of milk were consumed. It consisted of milk (dried milk was used), with small additions of cod-liver oil. The total calorie allowance was somewhat smaller than in the case of infants on the first type of diet. The quantity of milk was often 1¼–1½ pints at 5 months of age, and older infants occasionally received nearly 2 pints daily for short periods. Before 8–9 months of age little or no added carbohydrate was given. All children on both diets received additional antiscorbutic diet daily, from the time of admission, in the form of orange juice, tomato juice, or swede juice. The infants lived in well-lighted, airy wards. During the summer they were much out of doors, but during the cold Austrian winter they were indoors for weeks at a time.

(2) *Number and General Condition of Infants.*—The records include 36 infants. Twenty-five of the children were admitted under 3 months of age; at the time of the last observation, their age varied from 5½–21 months, 23 being over 9 months. The time in hospital varied from 4½ to 15 months. Three had rickets on admission, and nearly all were under weight at that time, but they were not suffering from acute illnesses. On the whole the level of general health was fairly satisfactory during the period of observation, though there were many minor intercurrent illnesses, such as colds in the head and otorrhœa. Six infants on the first type of diet developed radiographic evidence of rickets in the winter.

(3) *Percentage of Hæmoglobin.*—Approximately 220 hæmoglobin estimations were made with Haldane's hæmoglobinometer from blood collected from a prick in the heel; unfortunately they were not done at regular intervals, as their purpose at first was merely the comparison of infants on the two types of diet. In only three infants of this series was a complete blood count made—in these cases the red count was over 5,000,000 per c.mm. on every occasion, but there was a low hæmoglobin reading of 50 per cent. or less, and consequently a colour index of less than 0·5. The leucocyte count was 12,000–18,000 per c.mm., and the differential count was normal. There was slight polychromatophilia and poikilocytosis. In other words, there was marked anæmia of the so-called "chlorotic type."

Towards the end of the first year of life the majority of cases showed a drop in hæmoglobin, and 23 of the 36 infants had at some time less than 65 per cent. of hæmoglobin. Of 15 infants who were in hospital after 12 months of age, 14 developed a hæmoglobin percentage of 39–65 per cent., and of 23 infants in hospital after 9 months of age, 20 had at some time less than 65 per cent. of hæmoglobin, and 10 less than 55 per cent. Anæmia was generally first noticed between 9 and 12 months of age, but in several cases was well marked (50 per cent. to 60 per cent. of hæmoglobin) between 6 and 9 months of age. In only one child under 6 months of age was the hæmoglobin percentage under 65 per cent. This was a sickly, newly-admitted infant of 2 months, and the hæmoglobin percentage by 5 months of age had risen, with improvement in the general health, to 82 per cent.

These figures indicate that nearly all infants fed on the types of diet described developed anæmia at the end of the first year of life, in spite of good hygienic conditions and in many cases in spite of good general health. A number of infants, notwithstanding the low hæmoglobin content of their blood and their striking pallor, appeared to feel remarkably well and were extremely active. From the numbers observed there was no evidence that anæmia was more marked among infants on one type of diet than among those on the other, although one group of infants received cereal and vegetable additions to their dietary earlier than the other group. Possibly a larger number of cases might have revealed some difference. Eggs (½–1 daily), given for 3 to 5 months to a few infants, appeared to exercise no influence on the degree of the anæmia. Nor was the anæmia particularly associated with rickets; some cases who developed slight rickets had no anæmia, and in a case with no clinical or radiographic evidence of rickets the hæmoglobin fell as low as 39 per cent. There was no clear association between anæmia and so-called exudative diathesis (cf. Kleinschmidt[11]), nor with splenic enlargement. Only one of these cases had a definitely enlarged spleen, and in that case the degree of anæmia was slight. Cases with anæmia showed no tendency towards spontaneous recovery. There was in winter a progressive fall in the amount of hæmoglobin after the condition had developed. Outdoor life and summer conditions, with the resultant improvement in general health, did not bring about improvement in the blood condition in a single case in which anæmia had occurred, but in some cases the condition seemed to have been arrested.

(4) *Treatment.*—The form of treatment given was the administration of iron salts by mouth. The preparation used was ferri carb. sacch., 4½–9 gr. daily. The doses were given in the food and caused no digestive disturbance. Twelve infants received this treatment for from 1½–3 months, and seven showed

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* See Studies of Rickets in Vienna, 1919–22, Medical Research Council, Special Report Series No. 77. A preliminary report of these investigations was published in THE LANCET, 1922, ii., 7.

a good response with increase of 14–38 per cent. of hæmoglobin, and were discharged with 64–77 per cent. of *hæmoglobin*. Improvement was not noted in any case until 3–4 weeks after treatment was begun, and in one case in which the percentage of hæmoglobin increased from 49–71 per cent. in 2¾ months no improvement was noted in the first six weeks of treatment. It is clear, therefore, that to give iron treatment a fair trial one must persist with it for a number of weeks. Of the remaining five cases, three showed an increase of hæmoglobin of 6–10 per cent., and were improving at the time of discharge, and two showed no improvement after 1¼–1¾ months' treatment. Several of these five had been handicapped during the period of treatment by other causes, one had an operation for the removal of tonsils and adenoids, one had a pyrexial attack with tonsillitis and otorrhœa, and one was suffering from an X ray burn—the result of a previous unsuccessful attempt to treat the anæmia by radiation of the spleen. If the period of treatment had been longer, there is little doubt that further improvement could have been obtained in the majority of cases. Finkelstein[2] holds that at least three months' treatment should be given in every case, and says that there is no improvement in the hæmoglobin percentage in the first few weeks after the beginning of a course of iron treatment. None of the cases under consideration was treated by a reduction of the quantity of milk in the diet, so that no opinion can be offered as to this method of treatment. But the advocates of strictly dietetic treatment state that the complete change in diet is usually accompanied by a loss of weight, and often results in a refusal of food and a digestive upset (Kleinschmidt[11]), so that if the same object can be attained by the administration of iron without any untoward effects, there is no doubt that the latter would be the treatment to be preferred.

Prophylaxis.

More important than the question of treatment is that of prevention. The evidence available, in the opinion of the author, strongly supports the view that the anæmia is the result, in part at least, of iron starvation, but what other factor or factors play a part in its production is as yet uncertain. Milk contains very little iron; the infant is dependent on the store in its liver, and it has been shown that this store is very low by the end of the normal period of lactation (Bunge[5]). Thus, if the store is used too quickly, the child may well suffer from an insufficiency of iron during the first year of life, and this is likely to happen in an infant fed from an early age on cow's milk on account of the smaller percentage retention of iron in an artificially-fed child.

Attempts to produce anæmia in young animals by giving diets containing insufficient iron have not given consistent results (Kleinschmidt,[11] Hausermann,[14] Schmidt[15]), but have usually resulted in marked anæmia. In view of the recent advances in the technique of dietetic experiments on animals, much of the work of earlier writers appears now of lessened value, but the recent work of Happ[16] on young rats indicates that a diet containing insufficient iron (or for that matter a diet of cow's milk or cow's milk and bread) will not produce anæmia in these animals in the first generation, but that it may occur in the second generation. Possibly, therefore, an insufficiency of iron is only one factor producing "alimentary anæmia" in infants. Nevertheless, if iron starvation plays a part in such anæmias, the question of how the deficiency of iron in the diet is to be supplemented, and from what age this should be done, requires consideration. Finkelstein advocates the administration of fruit juice and vegetables from an early age—to premature infants from 4–5 months of age—but states that such a diet will not necessarily prevent anæmia in premature babies. Kleinschmidt is emphatic that mere supplementing of a milk diet with vegetables without marked reduction in the quantity of milk will not cure the anæmia. Small daily rations of vegetables given to many of the children at the Meidling Hospital from the age of 6 or 7 months did not prevent anæmia, and the giving of eggs to older babies appeared to have no beneficial effect on the amount of hæmoglobin. No evidence was obtained as to whether or not supplementing the milk dietary with any other foodstuff, for instance gravy or meat juice, would have proved prophylactic. In any case, it seems highly desirable that the question of prophylaxis should be further studied, and this the author hopes to have the opportunity of doing in the near future.

Most medical officers in charge of infant welfare centres must have been struck by the number of pale-faced babies attending. What proportion of these are truly anæmic can only be ascertained by examination of the blood, but the number must often be large. No doubt many of these anæmias are not primarily dietetic in origin, but if, as seems probable, one frequent cause is iron starvation, it would appear advisable to administer some form of iron salts as a drug to all such cases at an early stage, whether or not other treatment is given.

Summary.

1. There is a general consensus of opinion that too prolonged and too exclusive a milk dietary produces anæmia in infants and young children. This is probably due in part at least to iron starvation, on account of the low iron content of milk. Some writers, however, have held that it is directly connected with a toxic effect resulting from excessive milk consumption. Premature infants are known to be particularly liable to this form of anæmia.

2. In a group of 36 artificially-fed infants, receiving milk or milk and carbohydrate diets, with or without cod-liver oil, the majority developed anæmia. It was usually noted towards the end of the first year of life, but sometimes appeared as early as the seventh month. Additions of vegetables to the diet from 6 or 7 months old did not prevent anæmia. The infants were in well-lighted and well-ventilated wards, and were much out of doors in summer but very little in winter.

3. Treatment by the administration of inorganic iron salts by mouth brought about improvement in the majority of cases treated, but not in all, possibly because treatment was not continued for a sufficient length of time.

4. No improvement was noted in the hæmoglobin content of the blood in any case within three to four weeks from the beginning of treatment, and improvement might be delayed for six weeks with, thereafter, rapid progress.

5. It is suggested that many cases of anæmia in infants, particularly in those artificially fed from an early age, are probably associated with iron starvation, more especially as it has been experimentally demonstrated that the iron retention of an infant on cow's or goat's milk is much lower than on human milk.

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14. Häusermann: Die Assimilation des Eisens, Zeitschr. f. Physiol. Chem., 1897, xxiii., 555.
15. Schmidt, M. B.: Uber die Organe des Eisenstoffwechsels und die Blutbildung bei Eisenmangel, Verhandl. der Deutsch. Pathol. Gesellsch., 1912, xv., 91.
16. Happ, W. M.: Occurrence of Anæmias in Rats on Deficient Diets, Bull. of Johns Hopkins Hosp., 1922, xxxiii., 163.

Reviews and Notices of Books.

A TEXT-BOOK OF THERAPEUTICS.

Including the Essentials of Pharmacology and Materia Medica. Sixth edition. By A. A. STEVENS, A.M., M.D., Professor of Applied Therapeutics in the University of Pennsylvania, Philadelphia; Visiting Physician to the University and the Philadelphia General Hospitals. London and Philadelphia: W. B. Saunders Company. 1923. Pp. 793. 30*s*.

THIS book is one which deserves to be better known in this country amongst students who have attained to house appointments and amongst all actively engaged in the practice of medicine. Of the books on treatment at present available which are at once comprehensive, up-to-date, and discriminating, it is one of the best we have met. It is divided into two parts, of which the first deals with the various therapeutic agents, their pharmacological action and method of application; the second part, occupying the last 250 pages, is a compact survey of the treatment of most acute and chronic diseases. A prominent feature is the inclusion of numerous prescriptions and a discussion of incompatible substances. In addition to the various pharmacopœial preparations mentioned, useful attention is given to a consideration of the better known proprietary preparations. The chief merit of the book, however, lies in its exposition of modern methods. There is a good account of C. Eggleston's views on the value of administering large doses of digitalis, and of the indications for and against the use of quinidine in heart disease; of Schleich's method of infiltration anæsthesia with local anæsthetics; of the Schick test and of Park's results with toxin-antitoxin mixtures in immunisation against diphtheria; of the treatment of amœbic dysentery with emetine-bismuth-iodide by the mouth; of Chandler Walker's method of treating bronchial asthma with specific proteins; of the Allen treatment of diabetes, which includes a table giving the protein, fat, and carbohydrate percentages in ordinary foods; of the Sippy treatment of gastric ulcer. Chapters, written with judgment and restraint, are devoted to electrical treatment, massage, the Nauheim treatment for chronic heart disease, X ray and radium therapy and the Finsen-light treatment. Turkish and Russian baths, hot packs, hypodermoclysis and gastric lavage are discussed.

A book of this kind should obviously be of great value, presenting as it does within one volume a critical account of so many matters otherwise only available in scattered papers.

There is surprisingly little to which exception can be taken. There is no mention of the treatment of tuberculosis by heliotherapy in climates where the high cooling power of the air makes prolonged exposure to sunlight possible; indeed, Prof. Stevens thinks that sanatorium treatment has been shown to be equally successful in all climates. The work done in this country during the war on the treatment of shock has hardly received adequate attention. While Bayliss's gum-saline is described in the chapter on infusion and hypodermoclysis, the author has nothing better to advise for shock than adrenalin and pituitary extract. Unless A. Krogh's recent work on the frog is to be taken as such an indication, there is as yet no evidence whatever that pituitary extract is of the slightest value in shock treatment; the defect is one of the capillary circulation which pituitary extract does not influence. Perhaps a more serious error occurs in reference to the use of pituitary extract in labour. Prof. Stevens states that when the os is fully dilated, in cases of uterine inertia, 0·5 c.cm. of pituitary extract may be given. It is not sufficiently realised how potent this remedy is, and text-book statements of this kind, if followed up, are bound to produce the opinion that the extract is dangerous; for such a dose is two or three times too great. Doses of from 0·1 c.cm. to 0·2 c.cm. of the ordinary 10 per cent. extract are amply sufficient for administration in the second or first stage; ignorance of this important point has led many conscientious obstetricians to neglect the valuable aid pituitary extract can give.

A dozen such criticisms, however, leave the main excellence of the book unimpaired; such points are inevitable when the net is cast so wide. The author is to be congratulated on having on so many sides and with so much judgment succeeded in presenting such an excellent work in the limits of one volume.

MULTIPLE SCLEROSIS (DISSEMINATED SCLEROSIS).

Being Vol. II. of the Series of Investigations and Reports of the *Association for Research in Nervous and Mental Diseases*. New York: Paul B. Hoeber. 1922. Pp. 241. $3.75.

IF the report on disseminated sclerosis by numerous distinguished American investigators does not yet solve the problem of the disease, it brings us somewhat nearer that desirable end. The reader familiar with the subject naturally turns to the sections dealing with the nature and ætiology of the affection, only to find that the Commission declares it extremely difficult to decide whether the disease is inflammatory or degenerative; in fact, they admit frankly they have not reached a conclusion on the question of the existence of *acute multiple sclerosis as distinct from* encephalitis or lues. They cannot regard the problem of a possible micro-organismal origin as either confirmed or unsubstantiated on histological grounds. It might appear as if we are farther off than ever from the solution of a common and widespread organic nervous disease. What is of value in this report, however, is the collation of an immense amount of data in reference to the geographical distribution, incidence, frequency, racial apportionment, and general ætiological factors of multiple sclerosis; the setting of the problem, we may say, is rendered more distinct thereby. The chapter on general and special symptomatology apparently omits any reference to the interesting group in which epilepsy is an early, sometimes the very first, symptom of the disease. There is an excellent bibliography, but the volume is sorely in need of an index.

THE COMMON NEUROSES: THEIR TREATMENT BY PSYCHOTHERAPY.

By T. A. ROSS, M.D., F.R.C.P.E., Medical Director, Cassel Hospital for Functional Nervous Disorders. London: Edward Arnold and Co. 1923. Pp. 256. 12*s*. 6*d*.

DR. ROSS opens by a survey of the many fashions that have come and gone in the theories and treatment of the neuroses—the exhaustion theory, with its rest cure, the "reflex" theory with treatment directed to the uterus, to minor refractive errors, to "dropped kidneys," nasal spurs and deflections or to "dropped kidneys," and the still current toxic theory—and decides that enthusiastic if short-lived belief was the agent that removed symptoms. Drawing almost entirely upon his own experiences, of which 17 years were spent in general practice—a source of ample material for the study of neuroses—he demonstrates the psychogenic nature of these conditions and provides copious illustrations of his methods of treating them. He relies upon analysis, explanation, and persuasion combined or as alternatives, and the frank accounts of his own difficulties and failures, together with a restrained tone throughout the book, are a welcome contrast to those optimistic writings upon psychotherapy which raise the suspicion that here, too, we may have only another phase of enthusiastic belief. His attitude towards psycho-analysis is not well defined. In the preface he takes the view, scarcely justified by a retrospective glance, that ten years ago the spell of Freud was so potent that the writings of Dejerine were unduly handicapped. Giving full credit to Freud's work and making free use of his methods, he employs the strange phrase, concerning the taking of a history, that " there is no taint of psycho-analysis about it " (p. 112). It is perhaps fear of this taint that makes him skim lightly over difficult problems. Sexual impotence, for example, cannot always be removed by reassurance, and the marriage of an impotent man, which he would allow (p. 110), is often followed by unhappy results; sexual frigidity in women, an equally potent source of unhappiness, or worse, is not mentioned. Dr. Ross's handling of the compulsion neurosis is weak, in both the treatment and the symptomatology of this important and often unrecognised condition. He shares the view, which possibly had origin in a mis-translation in an American edition of Freud's " Introductory Lectures," that analysis is contra-indicated in this neurosis, and describes his own failure in a patient of 49, who was " physically and psychologically a rather old man " ; few psycho-analysts would have attempted the task in a patient of that age and type, but analysts claim most satisfactory results in properly selected obsessional cases, and Dr. Ross, in quoting Jelliffe, gives the unfortunate impression that the gloomy prognosis is orthodox.

These weak points, however, detract but little from the usefulness of the book to the general practitioner, for whom it is written and to whom it may be cordially recommended.

MEDICAL DIAGNOSIS.

Fifth edition. By CHARLES LYMAN GREENE, M.D., formerly Professor of Medicine, University of Minnesota and Chief of Medical Clinic in the University Hospitals. London: William Heinemann. 1922. Pp. 1453. 63s.

THE new edition of this work contains 75 new illustrations and an additional 150 pages. More than half of the new matter is included in the section dealing with disorders of the heart and blood-vessels to which Prof. Green devotes particular attention, the many facsimiles of electro-cardiograms being very valuable. We doubt whether all readers will agree with his remarks on " drop heart," and feel that auricular flutter should be included in the classified list of arrhythmias on p. 543, but otherwise we find this section illuminating. The vast amount of information in the book is made readily accessible by the excellence of the indices as well as by the provision on each page of a margin containing terse epitomes. The author's descriptions of the latest tests and aids to diagnosis, and his reasoned and moderate view of their individual value enhance the value of the work which, if too comprehensive for students, forms an excellent text-book of diagnosis.

CYSTOSCOPY AND URETERIC CATHETERISATION.

Traité pratique de cystoscopie et de cathétérisme urétéral. Second edition. By G. MARION, Professeur agrégé à la Faculté, Chirurgien de l'Hôpital Lariboisière (service civile); and M. HEITZ-BOYER, Professeur agrégé des voies urinaires à la Faculté, Chirurgien de l'Hôpital Saint-[illegible] Paris: Masson et Cie. 1923. Pp. [illegible]

IN the second edition of their book on Cystoscopy MM. Marion and Heitz-Boyer have not changed the general arrangement of the work. They have, however, entirely rewritten the chapter d[illegible] the optical principles involved and [illegible] pretation of images; and they have now given less space to the discussion of direct and indirect (or reversed) images, for as they justly remark, urinary surgeons should be equally conversant with both methods. One chapter is new and deals with urethrocystoscopy as first described by Buerger. Many additions have been made in the chapters on pyelography, the estimation of renal efficiency, and cystoscopic operations. It is of interest to note that these surgeons prefer the high-frequency spark to the diathermy current as employed in this country, believing that the former is more exact and more easily controlled.

The second edition should appeal to an even larger number of the profession than the first. It is admirably written, and has the advantage of being based on the personal experiences of two well-known genito-urinary surgeons. It contains in all 60 plates, mostly in colours, of cystoscopic findings, described in no less than five languages.

SELECTED PAPERS AND ADDRESSES.

By WILLIAM WILLIAMS KEEN, M.D., LL.D., Emeritus Professor of Surgery, Jefferson Medical College of Philadelphia. Philadelphia: George W. Jacobs and Co. 1923. Pp. 340.

Prof. Keen is well known on this side of the Atlantic as the doyen of surgery in the United States, and his book shows that he can write lucid and literary English with something of that indefinable quality which pervades the writing of John Brown of the " Horæ Subsecivæ." The papers and addresses were written at various times and upon different occasions, and therefore, as Prof. Keen implies in his preface, are not necessarily to be taken as setting forth the present-day opinions of their author. Some of them, however, deal with matters which are as permanent as anything can be in this world of flux, as, for instance, the paper upon the conditions of surgery before and after Lister: that upon the benefits not only to human beings, but also to the lower animals derived from experiments upon animals; and that entitled " Things Surgeons Stand For."

Other papers deal with the Service of Missions and with the impossibility of a war between Great Britain and the United States. Altogether the collection is a satisfying one which should be read and pondered not only by medical men, but by all who have the welfare of humanity at heart.

GENERALISED PAIN.

Being Part II. of the Clinical Symptomatology of Internal Diseases. By Prof. Dr. NORBERT ORTNER, Vienna. Authorised translation by FRANCIS J. RIEMAN. With an introduction by THOMAS WEBSTER EDGAR, M.D., New York. New York Medical Art Agency. 1922. Pp. 596.

To analyse and describe all the varieties and causes of pain in the body, literally, from scalp to [illegible] an ambitious project; to carry it out with any [illegible] of success is matter for congratulation. We [illegible] Prof. Ortner has reason to pride himself on [illegible] [illegible] for only a physician w[illegible] [illegible] specialties can [illegible] [illegible] in anything like [illegible] [illegible] heart, back [illegible] [illegible] bones, joints [illegible] [illegible]

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SIXTH CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY.

(Concluded from p. 147.)

WEDNESDAY, JULY 18TH.

Arthroplasty.

Mr. E. W. Hey Groves (Bristol) defined arthroplasty as an operative procedure upon an ankylosed joint with the object of restoring mobility. The pseudo-arthrosis occasionally resulting from an ununited fracture proved that the formation of a new joint with adapted articular surfaces and a capsule and synovia was within the powers of nature, yet the results of attempts to form a new joint by operation were variable and not always successful. Mobilisation of the elbow by some form of operation was usually successful, while arthroplasty of the hip and knee was frequently disappointing. The conditions most favourable to arthroplasty were bony ankylosis due to trauma or long cured pyæmia and occasional cases of osteo-arthritis and tubercle. The essential operative procedure in arthroplasty was the making of a gap between the articular ends, which gap must be maintained until healing took place; shaping and covering the articular ends was useful but not essential. Continuous traction on the new articulation and early voluntary movement were most necessary in after-treatment. In the elbow the suitable cases were those of bony ankylosis free from active infection, except those in which a strong useful arm was present in a labouring man. He considered that the best operation for the elbow was to preserve the whole width of the humeral condyles and to cover this bone with a free flap of fascia lata. In the hip there were three different types of operation to be considered: (1) For simple ankylosis an osteotomy of the neck of the femur with interposition of a flap taken from the fascia or from the capsule; (2) for massive hypertrophic ankylosis, a subtrochanteric osteotomy with the interposition of a fascial flap, forming a saddle-shaped joint; (3) for osteo-arthritis, excision of the head of the femur. In the knee any operation was unjustified if the joint were fixed in a good position, and it was only in the case of ankylosis of both knees that arthroplasty should be considered. The essential points in any such operation were the use of free fascia to cover the lower end of the femur, the preservation of the lateral ligaments, and the use of a jointed knee-cage for some months afterwards. If lateral mobility persisted, then the lateral ligaments must be reinforced by a second operation.

Prof. V. Putti (Bologna) gave his experiences gathered from 142 arthroplasties, the first of which was performed 10 years ago. He pointed out that arthroplasty was a severe and traumatising operation, and depended much for its success upon the coöperation of the patient in the after-treatment. It should therefore be reserved for patients of good vitality between 20 and 50 years of age, whose mental condition was good in that they were neither hypersensitive nor neuropathic. The profession of the patient was also important: in certain callings strength was preferable to movement. Bony ankylosis gave better results than fibrous: the ankylosis following acute infective arthritis (especially when the result of war wounds), polyarticular arthritis and certain cases of osteo-arthritis of the hip, and, rarely, of tuberculous arthritis were indications for arthroplasty. Operation should not be performed until after the lapse of a year from the time of the last acute manifestations. Ankylosis of the temporo-maxillary joint, bilateral ankylosis of the hip-joints, and ankylosis of the elbow in extension were all absolute indications. In the knee equally good results could be obtained as in the elbow. The operation consisted essentially of the partial resection of the joint which should be neither too extensive nor too sparing, and the exact fitting of the articular surfaces by means of gouges and files. The raw bony surfaces were then covered by free flaps of fascia lata, sewn into position, and the joint reconstructed by careful suture of the muscles, &c. Extension was kept upon the joint after the operation, and free use was made of active hyperæmia induced by radiant heat. Movements were begun by the patient in 12 to 15 days. After arthroplasty of the lower limb the patient should be able to walk within a month. The new joint was gradually and slowly developed as the result of use; the action of the flaps of fascia lata was merely temporary, but they were very helpful in the early stages. He had occasionally found it necessary to open one of these new joints some years after arthroplasty, when he found a condition strongly resembling the normal articulation. Movement was painless, and tended to increase with time rather than to decrease; the new joints were not affected by osteo-arthritis, but remained functionally good after many years of use. After delivering his report Prof. Putti showed cinematographic records of arthroplasty of the knee, showing all the details of the operation, the after-treatment, and the results. He concluded by exhibiting four cases in whom he had performed arthroplasty of the knee for bony ankylosis following war injuries. All four had a range of at least 90° of flexion from full extension (without undue lateral movement) and walked normally; it is worthy of remark that all were still serving in the Italian Army and doing full duty, two of them as officers.

Dr. W. R. MacAusland (Boston, U.S.A.) discussed the present position of arthroplasty, and pointed out in what respects it differed from mobilising excision. After a brief reference to the pioneer work of Baer, who used chromicised pig's bladder for interposition, and of the late J. B. Murphy, who developed the use of a pedunculated fat flap for the same purpose, he described the use of free fascia lata flaps after the method of Putti and Peyr, which had given the most uniformly successful results. Dr. MacAusland's report was lavishly illustrated with drawings and photographs, showing the technique and results of arthroplasty in the various joints in which he had found the operation of arthroplasty useful, notably the elbow-, hip-, and knee-joints, and cinematograph pictures were shown at the meeting of the operation of arthroplasty upon the elbow-joint. Access was gained to the joint by severing the olecranon process, and the remaining details of the operation resembled those of Prof. Putti's arthroplasty of the knee, except that only one bony surface (that of the humerus) was covered by the fascia lata flap. As a result of the operation, about 100° of movement could be obtained: in the earlier cases this was from full extension, but more recently he aimed at a range of from 45° to 145° (full extension = 180°), which he considered more useful. In considering the indications for arthroplasty, the speaker agreed broadly with those who preceded him, but he laid special emphasis upon the necessity for reserving arthroplasty for joints in which the muscles were still in good condition. The joints which gave the best results were the elbow, hip, and knee.

Dr. P. Santy's (Lyons) contribution was read by Dr. R. Leriche. Dr. Santy said that surgical mobilisation of ankylosed joints had so far been little used in France, probably because they continued to use Ollier's mobilising resection in certain cases. In the shoulder, elbow, and wrist Ollier's technique gave excellent results, but to obtain them great tenacity and patience was required, not only of the surgeon, but also of the patient during the weeks of mobilisation, while the articulation adapted itself to the neoarthrosis. Arthroplasty was, however, undoubtedly an improvement in technique, and hastened results. For the hip, mobilising resection was sometimes indicated, for example, in the case of large bony fusions where surgical modelling and interposition was difficult. Apart from these cases, arthroplasty was again an advance in treatment.

phenomenon in tabes," "motoric aphesia," &c.), we regret that the author's meaning should thus suffer in careless translation: "diseases of the brain occupy the area of the trigeminal nerve which is the original habitat of paræsthesias" (p. 281); "I do not refer to the sensible aura of epilepsy" (p. 330); "bitemporal contraction of the face (hemianopsia)" (p 287), &c. The English rendering becomes ridiculous when we are told that varicose veins cause "edema of the knuckle." Many unfamiliar expressions—"Wolhynian fever," "Sudek's atrophy," "Pappataci fever," "malum Rustii," "Bruck's disease," "Jack's disease" (can this be von Jaksch's disease?), "pyrgocephalus," &c. occur. For those, however, to whom the original is not accessible even an indifferent translation will be acceptable.

SURGICAL DIAGNOSIS.

Exploration clinique et diagnostic chirurgical. By Felix Lejars, Professeur de Clinique Chirurgicale à la Faculté de Médecine de Paris; Chirurgien de l'Hôpital Saint-Antoine; Ancien Président de la Société de Chirurgie. Paris: Masson et Cie. 1923. Pp. 778. Fr.60.

It is a charge frequently levelled at the present generation that its powers of diagnosis are vastly inferior to those of its forefathers. The charge can be easily answered, but no one denies that there exists room for improvement in this most difficult department of medical science. None will gainsay the existence of "clinical instinct," but this does not imply that diagnostic ability may not be acquired. How then may it be taught? We believe that an exhaustive, exact, and intelligent examination of the patient, combined with a judicial review of the history, will enable the student often to make accurate diagnoses, without having continual resort to multiple laboratory tests. It is for this reason that we welcome this book.

Prof. Lejars has set himself to describe a precise technique for the examination of every kind of pathological condition in every part of the body. He has succeeded in so doing in a concise manner, and has been aided in making his meaning easily understood by a very large number of illustrations. The style in which the book is written may not appeal to some in this country, and the reproductions of the X ray photographs are in most cases poor, but there can be no doubt that it is a book of great value and should appeal to a wide circle.

THE EVOLUTION OF MAN.

A Series of Lectures delivered before the Yale Chapter of the Sigma Xi during the Academic Year 1921–22. Edited by George Alfred Baitsell. London: Humphry Milford, Oxford University Press; New Haven: Yale University Press. 1923. Pp. 202. 15*s.*

There are six lectures included in this book, with a bibliography and index. The subjects of the lectures are the Antiquity of Man, the Natural History of Man, the Evolution of the Nervous System of Man, the Evolution of Intelligence, Societal Evolution, and the Trend of Evolution. The authoritative nature of the statements made is assured from the names of the collaborators, Profs. R. S. Lull, H. B. Ferris, G. H. Parker, A. G. Keller, E. G. Conklin, and President J. R. Angell. It is evident that the book is not intended for specialists in the various departments with which it deals, but rather for those others who desire acquaintance with what is being thought and said in the biological world and laboratories. We have read the book with very great pleasure, for the lectures are not only authoritative but are phrased in clear and simple language. The earlier lectures are clearly illustrated. We can heartily recommend this work to the medical man who has little time to spare but wishes to know how matters evolutionary stand to-day. The volume is handy and well produced.

SURGICAL ANATOMY OF EMERGENCY OPERATIONS.

Topographische Anatomie dringlicher Operationen. Second edition. By J. Tandler. Berlin: Julius Springer. 1923. Pp. 118. 8*s.* 4*d.*

In this book the surgical anatomy of emergency operations is considered and the steps of each procedure set forth. The descriptions are clear and the many very beautiful illustrations self-explanatory. In a book devoted to anatomy only one naturally looks for an account of variations in the typical relations of the structures in the gastro-hepatic omentum, a subject of great importance to the surgeon. But this does not appear, probably because the author is an anatomist and not a surgeon. The latter gets the impression at operations that the cystic artery rather more commonly passes behind than in front of the common bile-duct, as depicted on p. 67. By a printer's error, the structures shown in Fig. 54 have been wrongly labelled. The oblique lumbar incision for exposing the kidney is described, but when, in an emergency, a bilateral nephrotomy or decapsulation has to be performed, the Mayo approach, which is not mentioned, is simpler and quicker.

VISCEROPTOSIS.

Les désanglés du ventre; Maladies par relâchement des parois et organes abdominaux. By Dr. Chauvois. Paris: A. Maloine et Fils. 1923. Pp. 167.

In this little book Dr. Chauvois described the varieties and results of atony of the abdominal wall, with its effects on the abdominal viscera. The illustrations are an important part of the work, being for the most part arranged in pairs to show the clinical types under discussion side by side with types of healthy and well-built subjects. Full recognition is given to the writings of Glènard, and the author has made no attempt to cover every aspect of his subject; technicalities are avoided, for Dr. Chauvois appeals not only to medical men, but also to lay people, and especially parents. With this object, in the chapters on treatment the greatest prominence is given to the early stages of the disability and to its prevention, particularly in childhood. Methods of general hygiene, and the value of correct abdominal supports, fresh air, baths, athletics, and special breathing and gymnastic exercises are described. In England we have been rather in advance of France in these matters, but abdominal atony is only too common, and this book is of considerable educational value; its main practical defect is that insufficient attention is directed to the importance of looking for and eradicating any focus of sepsis, in children especially, for this is the primary cause of the lethargic habit in very many cases.

SURGERY.

Grundriss der gesamten Chirurgie. Second edition. By Prof. Dr. Erich Sonntag, Vorstand des Chirurgisch-poliklinischen Instituts der Universität, Leipzig. Berlin: Julius Springer. 1923. Pp. 937. 11*s.* 8*d.*

This book is written in the form of a synopsis of general surgery. It is well arranged and classified under suitable headings for the various systems, and could be used by students as a "crammer" for revision before examinations, or by the practitioner for reference in times of emergency. To literary style it makes no pretence, and it confines itself to the orthodox teaching of the day, without attempting to present or to solve any of the numerous controversies with which modern surgery abounds. The book includes a short chapter on operative surgery, which, while necessary for the completion of the work, is almost too short and sketchy to be of much practical value, more especially as it lacks illustrations. The fact that a second edition has appeared is sufficient evidence that the book is in demand and fills a definite place in the literature of its kind.

tissue. When the nerve was bruised, it seemed best to preserve it and keep it under constant observation. When some time had elapsed before the patient had received medical attention, the lesion should be operated on as quickly as possible. Aseptic operation, however, was essential, and it might be necessary to wait some weeks until all signs of suppuration had disappeared. As regards the operation to be done, Prof. Gosset thought that in the case of nerve compression with signs of irritation, simple liberation was all that was necessary. Intra-nervous extraneous bodies should always be taken out, but small intrafascicular fibromata should be enucleated only when the operation was without danger to the healthy nerve bundles. If there were interruption in the continuity of the nerve which showed no improvement after several examinations, resection of the fibrous callus and suture of the neurilemma should be undertaken. If suture were impossible, a graft, or the dividing into two of the lower end, should be practised. Good results would only be obtained if the patient had been kept free from ankylosis and muscular contracture during the time preceding the surgical treatment. Experience had shown that the period of regeneration might extend from 18 months to several years.

In conclusion, he said that in war surgery, as well as in civil surgery, immediate suture of the nerves should usually be completely successful. If surgical treatment had been delayed from one month to two years, good functional results might occur in 40 to 50 per cent. of the cases. Even after this time treatment should be tried; it might be successful, but there was less chance. Nevertheless, it was his opinion that the surgical treatment of the big nerve trunks is by no means illusory if it were carefully practised by skilled specialists, and if the patient could be kept under prolonged observation.

Dr. Charles H. Frazier (Philadelphia) discussed the results of 3000 gunshot wounds of the peripheral nerves treated in the Reconstruction Hospitals under the control of the Surgeon-General's Office, U.S.A. Of these, about 2400 involved important nerves and 1800 were submitted to operations of various kinds, suture, lysis, or nerve transplants. Experience having shown that spontaneous recovery might take place up till six months after the injury, it was usual to delay operative procedure until the end of that period: further experience showed that successful suture could be performed after a lapse of two years. In three-quarters of the operations the procedure adopted was resection of the ends and suture; the technique was similar to that employed in other countries, and the actual resection tended to become more extensive with greater experience of the operator. Partial resection with suture was a delicate operation not often performed. When the resection had been so extensive that the ends could not be got together by any manoeuvre, such as transposition, he favoured a two-stage operation rather than "bridging" with a graft, since the results of the latter had, with only a few exceptions, been uniformly unsuccessful. As regards the quality of recovery from resection and suture, it was rarely perfect, and the question of the bearing of the intraneural plexuses on this elicited divergent views in America. It was difficult to account for the high percentage of failures in certain nerves—e.g., external popliteal. Neurolysis failed in 26 per cent. of cases. Finally, he considered that the results in these nerves were sufficiently good to warrant the re-exploration and suture if possible in cases of complete lesions of the median, ulnar, musculo-spiral, and sciatic. A complete statistical survey of the end-results was unfortunately prevented by the transference of the control of the cases to many different departments.

The Late Results of Surgical Intervention for Traumatic Lesions of Nerves.

Dr. A. Chiasserini read a paper by Dr. G. Verga (Pavia) who died recently. The part played by Italy in the study of the surgery of the peripheral nerves had been very important from a scientific point of view, thanks to the fundamental researches on the regeneration of nerves carried out at the Laboratory of Histology and General Pathology at the Royal University of Pavia, under the direction of Prof. Golgi. Dr. Verga himself had published the clinical results of 212 interventions on nerves (1916–18). It was only in a small minority of cases that we could obtain perfect recovery after surgical treatment. In a great many cases, considered to be successful, there was something lacking as regards sensibility or electric reactivity, or, perhaps, motility; in the latter case the operated limb was weaker and more easily tired. Usually the process of restoration of function stopped when only a more or less relative improvement was obtained. The precise estimation of the functional restoration of an operated nerve was always a delicate and difficult problem, and should only be undertaken by an experienced neurologist, who could have the cases under observation for a long time after operation. The percentage of improvement and recoveries obtained by Dr. Verga in 82 cases observed for over a year was (i.) recoveries, 52·4 per cent.; (ii.) improvements, 37·8 per cent.; (iii.) negative results, 9·7 per cent. He had included amongst the recoveries cases where a slight loss of strength or of function of the limb had been observed, and amongst the improvements all cases where, after operation, any favourable modification of the symptoms was manifest. Out of nine cases observed up to six and a half years after operation, only in one was a change for the worse observed. In all cases improvement had been the rule; this showed, he thought, that improvement is a question of time. The results obtained by suture and neurolysis were much superior to all other operations for making good great losses of nervous tissue. These other operations, however, should not be entirely condemned, because some of them, especially grafting, might give good results, but recourse should only be made to them where other means failed.

True End-results of Nerve Suture.

Mr. H. Platt (Manchester), who read a summary of a paper by himself and W. R. Bristow, said that the results of nerve suture had fallen short of expectations, as was shown by an analysis of the true end-results in 157 cases now published for the first time by Prof. J. B. Stopford. (See table on p. 174.)

The mere punctual appearance of the first signs of recovery was no indication that complete restoration of conductivity would eventually occur, and even in the very best results there was some departure from the normal. The most successful cases were those obtained in the musculo-spiral nerve, but even here the synergic action of the extensors of the wrist when "making a fist" rarely recovered. The median and ulnar nerves had both given disappointing results, the important sensory function of the former never having been completely restored. In the sciatic nerve the results again were poor; no case of recovery of the intrinsic muscles of the foot was recorded, and the type of sensory recovery had been defective, often leading to painful traumatic ulceration of the foot, for which amputation was sometimes demanded. *Neurolysis* (freeing or liberation of the nerve) when practised early, before the compression had resulted in degeneration of the axis cylinders, had given rapidly successful results in the return of both sensory and motor functions. But where the compression had been in existence for a long time the restoration of function depended upon regeneration of the axis cylinders through the interior of a nerve trunk, the seat of an interstitial fibrosis, and was therefore generally very incomplete. Nevertheless neurolysis was often a legitimate experiment to be followed by resection and suture at a later date, if signs of recovery did not ensue. *When nerve-suture failed*, an alternative procedure available in certain cases was tendon transplantation; this had been employed chiefly for musculo-spiral lesions, the pronator radii teres, flexor carpi radialis, and flexor carpi ulnaris being transplanted into the extensors

Arthroplasty had, in fact, created a new chapter in surgery.

Dr. Leriche gave it as his own experience of 25 cases of ankylosis of the elbow, 15 of which had been treated by Ollier's method and the remainder by arthroplasty with interposition, that the results of the former were at least as good as those of the latter. After seeing Dr. Putti's results, however, there could no longer be any doubt that arthroplasty of the knee was preferable to a stiff joint in the best position (full extension), which was at times very inconvenient to the patient.

DISCUSSION.

Sir William Macewen (Glasgow) pointed out that flail joints did not result from the old-fashioned excision provided the resection were kept within the limits of the capsule. The function of the interposed flap he believed was to limit the growth of bone from the raw bony surfaces; it was more important when the diaphysis was involved on account of the greater osteogenetic power of the diaphysis as compared with the epiphysis. He thought that movement might have been improved in some of the cases by a larger resection of bone. Dr. Putti's arthroplasty of the knee was undoubtedly a great advance in surgery.

Mr. R. C. Elmslie (London) considered that a knowledge of when to perform arthroplasty was more important than skill in the technique of the operation. One stiff joint might be very little disability; he knew of cases with an ankylosed hip who could walk ten miles, whereas a mobilised joint might be a great disability if, as sometimes happened, it were painful. Double ankylosis of the hip might call for a mobilising operation on one side, but as a rule arthroplasty was more often indicated in the upper than in the lower extremity. In respect of the shoulder arthroplasty failed to reproduce the complicated movements of the joint. In the elbow he obtained very satisfactory functional results by an excision, shaping the olecranon and preserving the triceps, without any flap interposition.

Sir W. I. de Courcy Wheeler (Dublin) said that arthroplasty of the shoulder was only indicated when scapular movement was deficient; bony ankylosis was better for a working man. It was unfortunate that no satisfactory results had yet been obtained from arthroplasty of the finger-joints; following Murphy, he had tried the interposition of discs of cartilage, but without success. He had performed successfully a double arthroplasty of the knee, but was cautious in advising the operation. Since early painless movement was necessary if a new joint were to be formed, he urged the necessity for excision of all remains of capsule and ligaments which carried nerves. In the hip he had been disappointed with his own results, although he had seen many encouraging results of others. Finally, he described the operation of cheilotomy (the resection of osteophytic masses) as having given astonishingly good result in osteoarthritis of the hip.

Dr. Jiraseck (Prague) gave the results of 25 arthroplasties at Prof. Kukula's clinic. The interposed flap consisted of omental fat in 9 cases, of subcutaneous fat in 7 cases, and of fascia lata in 9 cases. The most successful cases were in the elbow (88 per cent. successful) and knee (77 per cent. successful), while the one case of arthroplasty of the hip failed. Re-ankylosis, when it occurred, was due to the return of suppuration, or to lack of cöoperation on the part of the patient.

Dr. Villandre (Barcelona) described his results in arthroplasty of the jaw and elbow, and illustrated them by lantern slides.

Mr. R. A. Stoney (Dublin) considered arthroplasty unnecessary where excision gave a good movable joint. In the elbow in cases of war wounds he had obtained good results from excision (limited as regards the bones of the forearm, but more radical as regards the humerus), being careful to preserve the attachment of the triceps to the periosteum. The cavity left was packed with "bipped" gauze and later allowed to close by granulation.

Dr. T. Tuffier (Paris) found that the greatest difficulty in performing Putti's operation on the knee was to obtain and preserve the right gap between the new articular surfaces. To obviate this he employed a pair of jointed steel plates attached to the femur and tibia by screws; this was allowed to remain in place for about a month, during which it allowed of movements and abolished the need for extension. It was then removed under local anæsthesia.

Drs. Corachan (Barcelona), Zahradnicky (Prague), Ribas y Ribas (Barcelona), Puiz y Sureda (Barcelona), and Juracz (Posen) also spoke.

On Wednesday evening the members of the Congress were entertained at a reception by the Lord Mayor and Lady Mayoress at the Mansion House.

On Wednesday afternoon, at an "unofficial" meeting, Dr. Serge Voronoff (Paris) gave a further demonstration on the subject of testicular grafting, illustrated by cinematograph pictures of his experimental work on rams and goats, and of the results obtained in man. Dr. Pauchet (Paris) described the technique of blood transfusion, and also illustrated the methods employed by cinematograph pictures.

THURSDAY, JULY 19TH.

Nerve Injuries.

Dr. P. Henriksen (Skien) discussed the results of surgical treatment of injury of the nerves. He said that after a nerve had been cut with a sharp instrument the peripheral nerve tended to heal spontaneously without leaving any permanent injury. Sensibility reappeared as soon as there was contact between the nerve ends, and mobility after about two months. After a nerve had been sutured, function developed in the same way as in spontaneous healing if the suture had been correctly performed. But healing might not take place if fat were interposed, or if infection resulted. After secondary suture, sensibility appeared at once and mobility and the reactions to electrical currents might occur after two months, and develop as after primary suture. If the nerve were subjected to blunt force, such as crushing or tearing, the neurilemma nuclei were injured and some completely destroyed, so that part of the newly formed nerve fibres were not capable of living and degenerated. When the neurilemma nuclei were totally destroyed no new nerve fibres were formed and the nerve atrophied. The changes were most marked at the actual spot where the crushing took place, and the nerve was adherent to surrounding tissue. Improvement might be obtained in some instances by freeing the nerve from adhesions. The best method seemed to be to resect the thickened fibrous part. The degree of function secured then depended on the general state of the nerve.

Prof. A. Gosset (Paris) thought that the following cases of nerve wounds should be operated on:—

(*a*) *Cases of Progressive Compression Causing Serious Irritation or Interruption.*—In these types liberation could not injure the patient or the nerve, and he saw no advantage in delaying the operation.

(*b*) *All Cases of Complete Interruption.*—These should be clinically examined by competent neurologists, and if they showed no sign or regeneration, or showed signs of useless regeneration, should be operated on.

(*c*) *All Cases of Causalgias or Serious Neuritis.*—There was, however, no fixed rule for this latter type.

He said that war surgery had shown us that we should certainly, during the preliminary surgical cleaning of the wound, examine the state of the important vessels and nerves. This was still more necessary if from the first day there were signs of paralysis of a large peripheral nerve trunk. Any severed nerve should at once be stitched up to allow of rapid regeneration, and, moreover, to avoid formation of fibrous tissue. When the nerve was bruised, it seemed best to preserve it and keep it under constant observation. When some time had elapsed before the patient had received medical attention, the lesion should be operated on as quickly as possible. Aseptic operation, however, was essential, and it might be necessary to wait some weeks until all signs of suppuration had disappeared. As regards the operation to be done, Prof. Gosset thought that in the case of nerve compression with signs of irritation, simple liberation was all that was necessary. Intra-nervous extraneous bodies should always be taken out, but small intrafascicular fibromata should be enucleated only when the operation was without danger to the healthy nerve bundles. If there were interruption in the continuity of the nerve which showed no improvement after several examinations, resection of the fibrous callus and suture of the neurilemma should be undertaken. If suture were impossible, a graft, or the dividing into two of the lower end, should be practised. Good results would only be obtained if the patient had been kept free from ankylosis and muscular contracture during the time preceding the surgical treatment. Experience had shown that the period of regeneration might extend from 18 months to several years.

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The mere punctual appearance of the first signs of recovery was no indication that complete restoration of conductivity would eventually occur, and even in the very best results there was some departure from the normal. The most successful cases were those obtained in the musculo-spiral nerve, but even here the synergic action of the extensors of the wrist when "making a fist" rarely recovered. The median and ulnar nerves had both given disappointing results, the important sensory function of the former never having been completely restored. In the sciatic nerve the results again were poor; no case of recovery of the intrinsic muscles of the foot was recorded, and the type of sensory recovery had been defective, often leading to painful traumatic ulceration of the foot, for which amputation was sometimes demanded. *Neurolysis* (freeing or liberation of the nerve) when practised *early*, before the compression had resulted in degeneration of the axis cylinders, had given rapidly successful results in the return of both sensory and motor functions. But where the compression had been in existence for a long time the restoration of function depended upon regeneration of the axis cylinders through the interior of a nerve trunk, the seat of an interstitial fibrosis, and was therefore generally very incomplete. Nevertheless neurolysis was often a legitimate experiment to be followed by resection and suture at a later date, if signs of recovery did not ensue. *When nerve-suture failed*, an alternative procedure available in certain cases was tendon transplantation; this had been employed chiefly for musculo-spiral lesions, the pronator radii teres, flexor carpi radialis, and flexor carpi ulnaris being transplanted into the extensors

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THE LANCET.

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Traumatic Shock from a Clinical Point of View.

Dr. P. Mocquot read a paper which was the combined work of himself and his colleagues, Drs. M. Quénu and P. Duval. They showed the evolution of ideas concerning shock, and pointed out what the Medical Research Council and the Société Nationale de Chirurgie de France had done. They then turned to the clinical side of the subject, and laid stress on the early appearance of the peculiar symptoms of traumatic shock, and gave a list, based mostly on cases during the war, of the various signs, such as low temperature, low blood pressure, blood and urine analysis, &c. In addition to the recognised type they described a type of mitigated shock, often met with in ordinary surgery, caused by attrition of the tissues. It outlined a new chapter of surgical pathology. The prognosis of traumatic shock might be estimated by the temperature, blood pressure, and by the analysis of the blood and urine. The recovery of kidney function, the excretion of urea, and the diminution of the urea-content of the blood were the most favourable signs. Therapeutic treatment included prophylactic measures and the treatment of the shock when it occurred. Prompt medical and surgical treatment were a sine qua non of prophylactic care. The best surgical treatment consisted in the excision of the wound; immunisation by means of an anti-shock serum had not yet proved its efficiency, at least from a clinical point of view. The treatment of an ascertained case of shock might be symptomatic. The former was especially useful as a means of first aid. Causal treatment was grounded on the new view of shock as an intoxication, the seat of which was the traumatic lesion. Theoretically, the wound which gave rise to the toxins should be excised. Practically we were confronted with two separate questions as to whether the affected limb should or should not be amputated. In the former case recourse should be had to "primary" amputation. In the latter case the treatment should consist of thorough excision of the wound, and the devitalised parts should be cut out as widely as possible. The operation should be quick. The wound was sprinkled with hypertonic solution and no attempt should be made at first to bring the edges of the wound together. Further research was yet required to decide on the most suitable anæsthetic.

Mr. John Fraser (Edinburgh) pointed out that surgical shock arose from various causes, such as injury to a sensitive part like the hand, from the early symptoms of peritonitis, burns in a child, and extensive crushing injuries of the limbs. Whatever its origin, the essential feature of shock remained constant—namely, diminution of the volume of blood from its passage into the vast capillary system where it was not under the control of the bulbar vasomotor centre. The extent of this capillary system would be realised from the fact that if placed in line the capillaries of the human body would extend two and a half times around the world. There was growing evidence that these capillaries had an independent muscle system, and recently in observations on the swim-bladder of the eel he had seen dilatation of the capillaries occur from the shock of cutting.

Dr. Pauchet (Paris) held that all the symptoms of shock disappeared rapidly after oxygenated blood transfusion by Bécart's method. Operation shock should be avoided by a preliminary blood transfusion, repeated if necessary during the progress of the operation; transfusion should not be left until it was obviously useless. The effects of oxygenated blood transfusion were a lasting rise of blood pressure and improvement in the patient's condition from the supply of oxygen to the central nervous and endocrine systems: further acidosis was neutralised.

Dr. Ufreduzzi (Turin) said that in states of traumatic shock he used local or splanchnic anæsthesia for operations. He found it difficult to believe that the substance or toxin which produced shock came from injured muscle, since operation confined to muscle was not attended with shock.

Dr. Jiraseck (Prague) and Dr. de Zawadski also spoke.

Dr. W. W. Keen (Philadelphia) proposed a vote of thanks to the President and officers, naming especially Dr. Mayer, the secretary-general, and Sir D'Arcy Power and Mr. J. E. H. Roberts, the British organising secretaries, to whose work the success of the Congress was largely due. This was carried with acclamation, and Sir William Macewen replied.

It was announced that the next Congress of the Society would be held at Rome in 1926 under the presidency of Dr. Giordano (Venice), when the subjects for discussion would be (1) the Surgery of the Spleen, (2) Cerebral Tumours, (3) Radio-therapy in Uterine Cancer, and two other subjects to be chosen later by the scientific committee consisting of Mr. Percy Sargent (U.K.), Dr. Gosset (France), Dr. Alessandri (Italy), Dr. Henschen (Switzerland), and Dr. Ribas y Ribas (Spain).

The annual banquet was held on Friday, July 20th, at the Trocadero Restaurant, with Sir William Macewen, F.R.S., in the chair. The large company included the Presidents of the Royal Colleges of Physicians and Surgeons and of the leading London medical societies. Sir William Macewen toasted the foreign delegates, and Messrs. Alessandri, Mayer, Haussen, Petridis, Koch, Nicolaysen, de Lawadski, Kayser, de Quervain, and Crile, representing Italy, Belgium and France, Denmark, Egypt, Holland, Norway, Poland, Sweden, Switzerland, and the United States of America respectively, replied. The speeches dwelt almost entirely with the feelings of gratitude felt by the delegates for the hospitality which had been shown them in London, for the interesting work which they had inspected in the hospitals, and the excellent papers to which they had listened at the Conference. The next Conference in Rome was frequently mentioned and most hopeful anticipations were expressed that a large number of their London colleagues would be present to meet the foreign delegates.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

ROYAL SOCIETY OF MEDICINE.—The William Gibson Research Scholarship has been awarded to Miss M. Forrester-Brown, of Dundee.

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Modern experimental methods are throwing on the cancer problem a light which bids fair to be powerful enough to illuminate its darkest corners, and one cannot read the article by the Director of the Imperial Cancer Research Fund, which appears in this issue, without experiencing a thrill of expectation. The elaboration of a technique by which cancer can be produced practically at will, combined with other methods of biological research, such as tissue culture, must undoubtedly and in the near future lead to most important results. Already theories which for generations have dominated certain schools of pathology are in process of demolition. The vague conception of "tissue tension" by which the disappearance of a hypothetical physiological influence of one tissue or another was held to explain the origin of malignant growth is untenable in view of the modern conception that the cancer cell differs from its progenitor in the acquirement of an actual positive property, that of continuous proliferation, though the stimulus to this may be no longer active. And the behaviour of the malignant and innocent cells during propagation outside the body shows conclusively that anaplasia as described by v. HAUSEMANN does not really exist. There is no true assumption of embryonic character by the malignant cell, and no specific loss of differentiation. At the same time the actual facts of human and experimental pathology which have hitherto been inexplicable are rapidly becoming clarified. Isolated observations which have meant little or nothing in themselves are being dovetailed one into the other, and our conceptions of what constitutes the malignant process are becoming firmer and more clearly cut every day.

The most significant aspect of the new work, however, is that which indicates the presence of a profound systemic or constitutional change in the individual in whom a malignant growth has developed. That such a change occurs is shown by the failure of animals in which a malignant growth has spontaneously occurred, or has been produced experimentally, to react in the usual way to fresh applications of tar. There seems to be quite definitely a high degree of resistance to the development of a second tumour, and though the experimental observations are few they fall into line with the facts of human pathology. It is common knowledge, for example, that multiple or even double primary malignant tumours in the same individual are rare. Unless we conceive the possibility of the simultaneous action in different parts of the body of different cancrogenic influences, the development of one tumour must be inimical to the growth of another. What constitutes this resistant state is as yet quite obscure—its presence can be recognised experimentally, but there is nothing to indicate in what it consists. Nevertheless, we are justified in believing that the next few years will see the question answered, with results in the diagnosis and treatment of malignant disease which could not even have been foreshadowed a very few years ago.

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CHILD MORTALITY IN SCOTLAND.

THE rates of infant and child mortality in Scotland for a series of years up to and including 1922 are given in the fourth annual report of the Scottish Board of Health, recently issued and summarised on another page of our present issue. We note that in the three years 1919–21 the rate of infant mortality averaged 94 per 1000 births in Scotland, as compared with 84 in England and Wales. The only partial participation of Scotland in the degree of reduction of infant mortality secured in England is obviously a subject deserving of careful study. In both countries the rule holds good: that a high rate of infant mortality is associated in the same community with a high death-rate in children over 1 and under 5 years of age. Thus in the experience of Scotland as a whole, in 1915 an infant death-rate of 126·5 was associated with a death-rate at ages 1–5 of 22·5, while in 1921 an infant death-rate of 90·3 was associated with a death-rate at ages 1–5 of 12·4. A valuable table given in an appendix to the report shows the variations in, and by implication, the degree of preventability of infant mortality in different parts of infancy. Thus, at ages 6–12 months infant mortality per 1000 births varied from 4·1 in Perth to 26·5 in West Lothian, and from 32·1 in Hamilton to 14·4 in Dunfermline. Similarly at ages 3–6 months there were variations between 8·2 in Sterling and 23·8 in Kincardine, and between 9·7 in Clydebank and 27·0 in Aberdeen. At ages 1 to 3 months in towns with a population of over 20,000 infant death-rates varied from 6·3 (Hamilton) to 22·3 (Aberdeen), and at ages between one week and under a month from 26·4 in Perth to 6·9 in Kirkcaldy. At ages under one week the highest death-rate was 36·1 in Kilmarnock, and the lowest, 19·8, in Port Glasgow. It may be surmised that owing to inaccuracies of registration of age at death there may have been some transfer between deaths under one week and deaths in the next three weeks of extra-uterine life; but allowing for this, the variations in local incidence of infant mortality in successive parts of infancy are very striking, and show the need for further investigation. The figures point unmistakably to the preventability of a large part of the current infant mortality in the earlier months after birth.

Annotations.

"Ne quid nimis."

THE MUSEUM OF THE COLLEGE OF SURGEONS.

The most noteworthy event recorded by Sir Arthur Keith, conservator of the museum of the Royal College of Surgeons of England, in his recent annual report is the completion of the series of specimens which illustrates the principles of pathology —the great series which is now exhibited on special stands on the floor of Room III in the museum. In 1910 Prof. S. G. Shattock and Mr. Cecil Beadles began to select, arrange, and catalogue specimens for this purpose, and now, for the first time, a complete and systematic treatise on disease has been compiled, not in words, but in illustrative specimens. The work was broken into by the war, and subsequently by the high prices charged for museum materials, but in the spring of the present year the series of general pathology was completed. The scope of this section of the museum is now fixed; if changes are made in the future they will have to be done by replacement rather than by addition. The re-arrangement, re-mounting, and re-cataloguing of that department of the museum which illustrates disease of the various parts, organs, and systems of the human body is now being undertaken. During the year a special room was provided to house and exhibit the War Office collection of medical specimens—now known as the Army Medical Collection—which had been handed over to the custody of the College. During the last 12 months 370 specimens have been mounted and added to this collection and considerable progress has been made with its cataloguing. The series of teratology and of human osteology have received valuable additions during the year, and the mounting and arrangement of the material of the Onodi collection has made good progress. The preparation of a new catalogue of the human remains preserved in the museum, a task undertaken by Miss M. L. Tildesley, working under the Council of Scientific and Industrial Research, is still in progress. The completion of this work, which involves much labour and research into records, is regarded by the conservator as most important in view of the desirability of arranging the human remains at our disposal in a proper time sequence, in order to study structural changes in succeeding periods, and an appeal has been made to the Council of Scientific and Industrial Research to have Miss Tildesley's appointment renewed for at least another year. Reports on various human remains submitted to the College for examination have been made during the year and facilities have been afforded and material supplied to investigators in various fields. In a brief report from the curator of the physiological department of the museum, special attention is drawn to a series of eel larvæ presented by Dr. Johannes Schmidt in illustration of his important researches on the peculiar and till recently unknown breeding habits of this fish, among other recently acquired specimens. Mr. Alban Doran has almost completed the descriptive catalogue of the collection of surgical instruments in the possession of the College, a task to which he has given 12 years of his life. He is now engaged on the last section of the collection—the surgical instruments used by barbarous and semi-civilised peoples. 11,688 students and visitors used the museum during the past year. Specimens recently added to the museum will be on view in Room I from Oct. 8th until Nov. 5th next.

NEW DIRECTOR-GENERAL OF THE NAVAL MEDICAL SERVICE.

It has been officially announced that Surgeon Rear-Admiral Joseph Chambers will succeed Surgeon Vice-Admiral Sir Robert Hill as Director-General of the Medical Department of the Royal Navy on Oct. 1st. Sir Robert Hill, whose retirement will be received with regret, before his appointment some four years ago was Principal Medical Officer in the Grand Fleet, serving under both Lord Jellicoe and Lord Beatty. His excellent organisation at the Battle of Jutland received special commendation, and was recognised by his promotion to the rank of Deputy Surgeon-General. He was many times selected as medical officer on the ships which have carried the King and Queen when Prince and Princess of Wales on tours to India and the colonies.

Surgeon Rear-Admiral Joseph Chambers, who has had much administrative experience at Haslar, was appointed in 1908 health lecturer at the home ports, and later took over the charge of the Naval Hospital at the Cape of Good Hope. In 1913 he was appointed medical officer of the cruiser *Suffolk*, the original flagship during the war of the late Admiral Cradock, and in 1915 was transferred to Chatham Hospital. Since October last he has been in charge of Plymouth Hospital. We congratulate him on the high charge to which he has now been appointed.

OUTBREAKS OF SEPTIC SORE-THROAT SPREAD BY MILK.

Outbreaks of sore-throat, usually accompanied by other complications, spread by contaminated milk and due to streptococci, although not very common are yet sufficiently numerous to warrant careful consideration. Nearly all the earlier outbreaks were reported in this country, and Savage,[1] in 1912, gave particulars of 18 outbreaks in Great Britain. Since that date few further outbreaks have been reported here, but a considerable number has occurred in the U.S.A., many of which have been very extensive and have been studied in considerable detail. Notable American outbreaks are those in Boston, Chicago, and Baltimore. The pioneer scientific work upon the relationship between mastitis in the cow and human disease was done by Savage between 1906 and 1909, and is contained in three reports made to and published by the Local Government Board.[2 3 4] His views as to the relationship were summarised in a paper read before the Epidemiological Section of the Royal Society of Medicine, in February, 1911.[5] While in common with earlier continental workers he found that the ætiological factor in most cases of bovine mastitis was invasion by streptococci, he carried the subject further and differentiated between the types present. It is a striking fact that while on the one hand bovine mastitis is a widely prevalent condition and the importance of excluding from the milk-supply all the milk of infected animals is not well realised or acted upon, on the other hand, outbreaks of septic sore-throat from milk are rare. Savage was able to demonstrate that the ordinary type of streptococcus (*Streptococcus mastitidis*) associated with bovine mastitis is non-pathogenic to mice and other rodents, readily sets up mastitis in experimental goats, but fails to set up disease when inoculated upon the human throat. In contra-distinction the streptococci associated with human sore-throat possess a considerable pathogenicity for mice and guinea-pigs, but do not readily set up mastitis in goats. In one case, however, a streptococcus was isolated from a case of bovine mastitis which was of the human type. From his extended investigations Savage advanced the hypothesis which may be stated in his own words (1911): "Briefly stated, I regard the bovine udder and teat lesions, as commonly met with, as of purely bovine origin and, as such, harmless to man. Occasionally, either as an invasion superadded upon the original bovine lesions or as a primary infection of the milk-organs, there is a local infection with organisms of human origin. In such cases the conditions present may be decidedly prejudicial to man. In other words, the cow, in this class of infections, is only potentially pathogenic to man when it acts as an active or passive carrier of organisms of *human* origin."

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[1] W. G. Savage: Milk and the Public Health, 1912.
[2] Report of the Medical Officer, L.G.B., 1906–07, pp. 205–252.
[3] Ibid., 1907–08, pp. 359–424. [4] Ibid., 1908–09, pp. 294–315.
[5] Proc. Royal Soc. of Med., Epidemiological Section, 1911, iv., 73.

Since that date these conclusions have been very completely confirmed by extensive work in America, but conducted upon rather different lines. This work has mainly been in the direction of further differentiation of the types of streptococci found, particular attention being paid to their hæmolytic properties. For example, Theobald Smith and J. H. Brown[6] studied the streptococci isolated from certain milk-borne epidemics of tonsillitis in Massachusetts, in 1913 and 1914, and drew attention to the hæmolytic character of the strains responsible for the outbreaks, while they found the ordinary bovine streptococci to be non-hæmolytic. Their hæmolytic properties (β-type) are also different from those of the common throat streptococci (α-type). Other investigators, e.g., Davis,[7] have shown that hæmolytic streptococci may be found in many different types of milk and that these may differ from human hæmolytic streptococci in their being non-virulent to rabbits. The mere fact that they are hæmolytic does not establish their human origin. That hæmolytic streptococci of human origin may set up bovine mastitis in cows was shown by Davis and Capps[8] by direct experiment, the mastitis lasting for several weeks in the experimental cows, this time roughly corresponding to the duration of milk-borne epidemics. Jones[9] [10] [11] showed that both hæmolytic and non-hæmolytic types of streptococci may set up bovine mastitis, the human type producing the more severe inflammation. He also showed that a milker may readily carry streptococci on his hands from an infected to an uninfected cow. These and other investigations show that the differentiation of streptococci of human and bovine type, like all streptococcus classifications, is complicated and difficult and is not merely a question of hæmolytic ability. Other tests have been advanced, both by Savage and by the American workers. Avery and Cullen[12] have shown the advantage of determinations of hydrogen-ion concentration in glucose-broth cultures. Cultural sugar tests are also of importance. With present knowledge it would appear that, while no one test is conclusive, by employing a large series of differentiating characters it is possible to give an opinion with considerable certainty as to the type (human or bovine) of streptococcus present in a milk-spread outbreak. Brown and Orcutt[13] have found it possible in an outbreak in Boston in 1917 to identify the particular infective strain from the mastitis fluid with that from the sore throats of the sufferers.

The most recently recorded outbreak of septic sore-throat spread by milk is in Portland, Oregon, and is described by Benson and Sears.[14] The outbreak, which took place in March, 1922, was extensive, comprising 487 cases with 22 deaths. Almost all the cases drank milk from one particular dairy, which supplied non-pasteurised milk. The dairy supplied about 1200 persons, so a considerable number escaped infection. The mortality-rate was 4·3 per cent. It was ascertained that cows with diseased udders were kept in their regular stalls along with the healthy animals and in some instances only the milk from the diseased quarter was excluded from the milking. From one cow suffering from mastitis the authors isolated a streptococcus which they considered from its characters to be a human strain and which, as regards its virulence to rabbits and white mice, was of that type. It was identical with streptococci cultivated from the patients. Hæmolytic streptococci were isolated from only one of the milkers. This man had large red tonsils and gave a history of a mild sore-throat. They consider that this milker was responsible for the infection of the diseased cow's udder, that she developed a mastitis of human streptococcic origin in one quarter and that the milk of this cow was at some time included by mistake in the whole milk of the herd. The weak link in the argument is that the date of the examination of the milker is not given and no evidence is advanced to show that the milker might not have been a sufferer from consuming infected milk rather than the indirect cause of the outbreak.

THE CENTENARY OF THE EDINBURGH VETERINARY COLLEGE.

THE dawn of veterinary science in the north of Great Britain was due almost entirely to the dogged and persistent efforts of William Dick. For nearly 40 years he laboured in the teaching and demonstrating of animal diseases and ailments, and starting with a small class in Clyde-street he saw his efforts, after many struggles and vicissitudes, crowned with success in the establishment of the Dick Veterinary College. An interesting and well-written history of this Veterinary College, by Dr. O. Charnock Bradley, its principal, has just been published.[1] Since Dick's death the College has had several stalwarts associated with its activities and teaching. T. Strangeways, W. Williams, T. Walley, J. R. U. Dewar, and the great financial helper, Alexander Inglis Maccallum, have all been fine characters and men of mark. Many successful practitioners scattered over the United Kingdom and the colonies have emanated from the College and now the successor of the Clyde-street building at Summerhall will compare favourably with any veterinary college or school in the world. The book has some excellent photographs of the men who laid the foundations of veterinary science. A centenary fund is about to be inaugurated to found a post-graduate fellowship in veterinary science and the proceeds of the sale of this book are to go to the fund.

AN EPIDEMIC OF ERYTHEMA NODOSUM.

THE view that erythema nodosum is nothing more than a rather obscure manifestation of tuberculosis finds no support in the fact that now and then this eruption occurs in epidemics unrelated to any possible source of tuberculous infection. Such an epidemic has been reported by Prof. E. Ledoux in the June number of *Revue de Médecine*. In a school of midwifery 20 probationers were accommodated in a dormitory, along the walls of which some of the beds were placed. Other beds were in the centre of the dormitory, and it was a very significant fact that all the probationers developing erythema nodosum were accommodated in the central beds, which were close together. The first patient, aged 22, had been subject to frequent attacks of slight tonsillitis. On Dec. 9th, 1921, she attended a confinement, during which she felt perfectly well. On the 10th she developed a sore-throat, and in the evening of the same day an attack of shivering was accompanied by a violent headache and a high temperature; for some days it ranged from 38·5° C. to 40° C. There was no cough, and the urine was normal. Typical erythema nodosum developed on the 13th, when it first appeared on the legs. A day later some nodes also appeared on the arms. The temperature returned to normal on Dec. 21st, but during Jan. 21st, 22nd, and 23rd, and again during Feb. 3rd, 4th, 5th, and 6th, there were attacks of what seemed to be rheumatic fever, a temperature of 40° C. being associated with painful swelling of the knees and ankles. The next patient, aged 22, suffered for two or three days from slight headache and general malaise, but she was not at first ill enough to give up work. On Dec. 18th the headache became violent, and two days later there was an extensive eruption of erythema nodosum on the legs and arms. Three or four days later some nodes appeared on the face, and there was slight conjunctivitis on the left side. On Dec. 25th one knee became swollen and very painful. A blood culture proved negative. The third probationer fell ill on Jan. 1st, 1922, with headache and a temperature of 38·7° C. Next day erythema nodosum appeared on the legs, and on the 3rd there was an attack of epistaxis; the headache was now less severe. By the 11th she was convalescent, but on the 13th the temperature rose to 40·3° C., and the knees and ankles became swollen. The fourth probationer fell ill in the middle of January, when one erythematous node appeared on the left leg. She remained at work for four days, suffering only from slight lassitude. On the fifth day, however, the temperature rose to 39·5° C., and she complained of severe headache. An extensive outbreak of erythema nodosum now appeared on the limbs, and she was ill for 15 days with a high temperature. Convalescence was protracted and complicated by pain in the joints, lasting several weeks. Only the first patient suffered from a sore-throat at the beginning of the illness, but all four complained of severe headache and general malaise. In no case was there any family or personal history of tuberculosis, and there was no other evidence of tuberculosis.

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[6] Jour. of Med. Research, 1915, xxxi., 455.

[7] Jour. of Inf. Dis., 1916, xix., 236.

[8] Ibid., 1914, xv., 135.

[9] Jour. of Exp. Med., 1918, xxviii., 149.

[10] Ibid., xxviii., 253.

[11] Ibid., xxviii., 735.

[12] Ibid., 1919, xxix., 215.

[13] Ibid., 1920, xxxi., 49.

[14] Jour. of Amer. Med. Assoc., 1923, June 2nd, 1608.

[1] History of the Edinburgh Veterinary College. By O. Charnock Bradley. With illustrations. Edinburgh: Oliver and Boyd. 1923. Pp. 101. Parchment, 8*s.*; half linen, 5*s.* 6*d.*

STERILISATION OR SEGREGATION.

In a recent pamphlet entitled "Sterilisation and Mental Deficiency" (2*d.*) the Central Association for Mental Welfare include a considered report by their standing medical committee on the question of the surgical sterilisation of mental defectives, referred to them by the council of the Association in June, 1922. The report does not discuss legal or ethical considerations, but only the medical and biological problems involved. The provisional conclusion arrived at is that the sterilisation of defectives is not under existing conditions a practical policy, though it may be applicable to individual cases.

To effect sterilisation in either sex the surgical operations in common use are the following: (1) Vasectomy in the male; (2) salpingectomy or ovariotomy in the female. The evidence shows that vasectomy is a very simple and safe operation, that it effectively prevents procreation, and that it does not interfere with the physiological equilibrium of the individual. The operations necessary in the female are of a more serious nature and involve all the risks pertaining to an abdominal operation, as much risk perhaps as a simple operation for appendicitis. Ovariotomy interferes with the physiological equilibrium. Either operation prevents propagation. Sterilisation is recommended by its advocates for two main purposes: (*a*) With the object of ameliorating or curing certain abnormal or perverted sexual tendencies and improving the mental condition and character of the individual; (*b*) with the object of eradicating or preventing the spread of mental defect. The first of these objects would not be attained by the comparatively simple operations mentioned, and the committee regard the evidence as to individual improvement from the more serious operations of removal of the testes and ovaries as inconclusive. With regard to the racial effect of sterilisation in preventing mental deficiency, they draw attention to the following points. Excluding cases of mental defect which are not germinal in origin, but which are a consequence of accident or disease acting directly on the individual and are not transmissible, the weight of the available evidence is to the effect that although the fact of the transmission of mental defect by mentally defective parents is undoubted, a proportion only of mental defectives are the offspring of obviously defective parents. The majority are either the children of parents who appear to be normal, although frequently "carriers," or of those suffering from [illegible] mild degree of mental or physical [illegible] is not certifiable. [illegible] were all sterilisable [illegible] would not be [illegible] be effected to a partial extent. [illegible] in itself [illegible] partial prevention is [illegible] is, however, another aspect of the question. [illegible] proportion of mental defectives [illegible] their defect. [illegible] propensities or social incapacity [illegible] care necessary. [illegible] lessened by their sterilisation, and [illegible] segregation is [illegible] propagation and the best means of dealing with the social failures of the individual. It is regarded by the committee as a [illegible] procedure. [illegible] sterilisation of certifiable mental defectives might lead to a false sense of security and result in a large number of defectives who should be segregated being set at liberty. Sexual assaults, promiscuous sexual intercourse, and a direct increase in the incidence of venereal diseases and their sequelæ might be expected to ensue.

The committee add a note regarding the operation of sterilisation laws in the United States of America, where such laws have been enacted since [illegible] in 15 States. In five of these the law has been declared to be unconstitutional; in one (New York) it has been definitely repealed; in four the law is practically a dead letter; in three it is still being used, but only to a very limited extent; and in two only (California and Nebraska) is it said to be made use of at all extensively. The largest number operated upon has been in California (255[illegible] cases); these have been chiefly males, who were at the time inmates of State institutions, and no particulars are available regarding their subsequent career.

As an outcome of the report of this medical committee, the members of which include Dr. G. A. Auden, Dr. Helen Boyle, Dr. H. B. Brackenbury, Dr. Cyril Burt, Dr. R. H. Cole, Dr. [illegible], Lord Dawson, Colonel F. E. Fremantle, M.P., Dr. [illegible] Gill, Dr. G. B. Griffiths, Sir Frederick Mott, Dr. C. S. Myers, Dr. W. A. Potts, Dr. F. C. Shrubsall, Dr. A. F. Tredgold, Dr. F. D. Turner, and Dr. Meredith Young among others, the Central Association for Mental Welfare has formed the following conclusions: (1) That segregation is the best method of dealing with certifiable defectives who cannot adapt themselves to the existing social code; and (2) that judicious and kindly supervision is the best method of dealing with those not possessed of marked anti-social propensities. It is considered that these are the foundations upon which a satisfactory national scheme for dealing with the problem of mental defect may be built up.

LINITIS PLASTICA.

Dr. Albert F. R. Andresen[1] of the Gastro-Enterological Department of the Long Island College Hospital, who reports two illustrative cases in women aged 38 and 57, in whom the diagnosis was confirmed by autopsy, remarks that the term linitis plastica was first used by Brinton in 1854 to describe a diffuse increase in the connective tissue of the stomach and characterised clinically by an insidious onset, slowly progressive cachexia, and fatal termination. The most exhaustive study of the disease since Brinton's time was made by H. M. Lyle in 1911, who collected 131 cases from the literature to which he added one of his own. Linitis plastica is a disease occurring in persons of the carcinoma age, nearly all the cases on record being between the ages of 40 and 60. Males are affected twice as often as females. Usually there is some previous history of ætiological significance, such as cardio-vascular disease, alcoholism, gastric ulcer, syphilis, tuberculosis, or occupational trauma. The symptoms are not characteristic but are merely those of the achylia gastrica which is usually present, and consist in anorexia, nausea, upper abdominal discomfort or pain, vomiting, alternate constipation and diarrhœa, and more or less intense secondary anæmia. Hæmatemesis is rare. A feeling of fullness after ingestion of even small quantities of food is very suggestive, being a direct result of the actual diminution in size and loss of elasticity of the walls, as is also vomiting or regurgitation of any excess above a certain amount. Ascites may develop later. In advanced cases a sausage-like tumour may be felt lying transversely in the epigastrium. On inflating the stomach or injecting water into it through a tube the air or water may be felt gurgling rapidly through the tumour. Test-meal examination shows the rapid emptying of the stomach and the absence or reduction of hydrochloric acid. Fluoroscopic examination reveals a small hypermotile stomach, the barium mixture passing rapidly across the upper abdomen and filling the intestinal coils. The prognosis is not good, as even after removal of the gastric focus there may be progressive changes in the colon, rectum, and small intestine, causing stenosis. The average length of life in the benign cases is four years, and in the malignant two years. Treatment consists in gastrectomy, either primarily or in advanced cases, after a primary jejunostomy to improve the patient's nutrition sufficiently to make him fit for operation. In cases where the pylorus is sufficiently patent to admit the passage of a tube duodenal feeding is indicated before the operation.

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[1] American Journal of the Medical Sciences, June, 1922.

"LEAVING IT TO NATURE."

When there is a miscarriage of justice and an innocent person is in prison for many years, the community to which he belongs stands aghast in sympathetic horror. Medicine being a far more complicated matter than the law, it is, unfortunately, inevitable that serious medical errors—some only errors of omission—are often made, condemning the victim to years of invalidism and misery. Of late years there has been a healthy movement in this country as well as on the Continent to shun the omniscient pose and to reduce the incidence of future blunders by giving past blunders publicity—or as much publicity as the courage and conscientiousness of the blunderer permit. In *Le Scalpel* for June 16th Dr. de Harven, of Brussels, has recorded an instructive case which is probably not unique. The patient was a woman, aged 52, who had given birth to three infants, and whose last confinement 15 years earlier had been followed by severe puerperal fever. She was confined to bed by this illness for six weeks, and the vaginal discharge continued to be profuse and purulent; she suffered from general weakness and amenorrhœa. Exactly a year after her last confinement the purulent discharge suddenly ceased, the abdomen became painful, particularly in the left iliac fossa, and there was a rise of temperature. The practitioner who was consulted diagnosed a hernia; his offer to operate on it was rejected. At this stage the patient herself could feel a hard, painful swelling, of the size of an egg, above the pubes, a little to the left of the middle line. This swelling was evidently the uterus distended by pus, which, owing to obliteration of the cervical channel, could not escape as before through the vagina. The patient was very ill and emaciated at this stage, but she gradually became a little better, being able to drag herself about. She could not run or exert herself in any way; even slight movements provoked abdominal pain, and merely walking upstairs distressed her. For 14 years she dragged out this painful existence, the slowly growing tumour in the abdomen becoming more and more troublesome and painful. While she was convalescing from an attack of influenza, she suddenly experienced excruciating pain in the abdomen, and during the next few days there was incessant vomiting with fever and other alarming signs. After this state of affairs had lasted seven weeks and she was practically moribund, she was seen for the first time by Dr. de Harven, who found a swelling, as large as an adult's head, in the lower abdomen and in the middle line. It was dull on percussion and tender. The cervix was small and hard, and there was no discharge from it. On laparotomy the swelling was found to consist of the much distended uterus which was adherent to the anterior abdominal wall. The Fallopian tubes were normal, and the ovaries were small and hard. Detachment of the adhesions between the uterus and the abdominal wall set free a veritable flood of green, creamy pus, containing streptococci, and there proved to be more than a litre and a half in the uterus. Subtotal hysterectomy was performed, and though recovery was complicated by severe suppuration, she ultimately recovered, being restored to complete health—after 15 years of misery. Apparently the influenza had stirred the streptococci into renewed activity, and the agonising pain experienced some weeks before the operation was evidently due to perforation of the uterus. Fortunately the pus became localised by adhesions and did not spread throughout the abdominal cavity. The walls of the uterus were about five times as thick as normal and had undergone fibrotic changes. Within this dense fibrous capsule the lymphatics of the uterus had evidently been compressed, and thus the enormous bag of pus within the uterus had become effectively isolated, and the uterine appendages had remained practically normal. It is probable that the patient had acquired considerable immunity to the invading streptococci, for without such immunity she could hardly have survived the severe suppuration following the operation.

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

We have received from the Council of British Ophthalmologists details of correspondence which passed between that Council and the Registrar of the General Medical Council in the first half of the present year. In March the Council of British Opthalmologists drew the attention of the General Medical Council to statements in the final report of the Departmental Committee on the "Causes and Prevention of Blindness," which had recently been published, to the effect that the "inadequate knowledge of diseases of the eye possessed by the large majority of the medical profession on admission to the Register" is largely due to the limited training in this subject which they receive as medical students, that few universities and examining bodies in Great Britain require candidates for a qualifying degree or diploma to be examined in ophthalmology, and that although questions on ophthalmic surgery are occasionally included in a paper, or in the oral examination, these cannot be considered as an adequate test of the candidate's knowledge of this subject. The Committee further stated that in their opinion no licence to practise medicine should be granted without satisfactory evidence of an adequate knowledge of diseases of the eye. The Council of British Ophthalmologists pointed out that this recommendation of the Departmental Committee coincided with their own previously expressed views, and encouraged them again to urge the General Medical Council to insist, by means of an examination in ophthalmology, on a uniform standard of knowledge in this subject. The General Medical Council's ruling of May, 1919, laid it down that every student should be required to attend a course of practical instruction in ophthalmology of not less than 10 weeks' duration, and that no student should be admitted to the final examination unless he produced a certificate testifying to such attendance and to a satisfactory standard of work. To this the Council of British Ophthalmologists objected on the ground that the arrangement left the evidence of satisfactory work entirely to the discretion of the ophthalmic surgeon in charge, and that in the London medical schools the evidence of satisfactory work was receiving very different interpretations. "In one school every student is now required to pass an examination before his certificate is signed, in others mere attendance in an ophthalmic department is recognised as sufficient." This difference, they stated, engendered a feeling of injustice amongst students of different schools, and was unsatisfactory from the point of view of uniformity in the standard of requisite knowledge. The experience of the Irish universities and colleges showed that there was no great difficulty in conducting an examination in ophthalmology as an intrinsic part of the final examination for degree or diploma. After the recent Summer Session of the General Medical Council, the Registrar informed the Council of British Ophthalmologists that their letter had been considered by the Examination Committee of the Council, and that the greater part of the communication was printed in full in the report made by that Committee to the Council on June 1st.

Among the recommendations of the Committee adopted by the Council were the following :—

> That the Ministry of Health be informed that on May 25th, 1922, the Council made certain recommendations to the Licensing Bodies for the improvement of the medical curriculum, one of which was that each student should receive instruction, inter alia, in the diseases of the eye, refraction, and the use of the ophthalmoscope. The Council thereby anticipated the wishes of the Departmental Committee as set forth in their report, which was not published until the autumn of that year.
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> That the Council of British Ophthalmologists be informed that it is too soon to judge of the effect of the resolution recently adopted by the Council.

It was stated in evidence before the Departmental Committee that some of the worst results of ophthalmia neonatorum occur in cases which have from the beginning been under the sole charge of a medical practitioner. It may be left to the General Medical Council, acting with the vigilant assistance of the Council of British Ophthalmologists, to terminate the condition of affairs which allows such a statement to be made.

ELEVENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS, 1923.

Sir Edward Sharpey Schafer, presiding at the Eleventh International Physiological Congress, held at Edinburgh this week, noted that the several speeches of welcome, addressed to the delegates by Captain Elliot on behalf of the Government, by the Lord Provost on behalf of the City, and by the Principal on behalf of the University had become progressively more intimate, beginning with the country at large, passing to the city of Edinburgh, and ending with the University. It was his duty and pleasure, he said, to tender the most intimate welcome of all, that of British physiology. They had before them a counterfeit presentment of the greatest of all British physiologists—William Harvey—and the President asked their acceptance, as a memento of the occasion, of a medal which had been designed from this bust by Mr. Pilkington Jackson, who had also modelled the bust from Harvey's authentic portraits. The President desired especially to associate the name of Lister with the gathering in Edinburgh, partly because he was for several years professor of surgery in the University, but chiefly on account of the fact that the researches which preceded his great discovery were researches in pure physiology and were inspired by that great teacher William Sharpey, who migrated in 1836 from Edinburgh to London and to whom the speaker and many other British physiologists owed, directly or indirectly, their introduction to the science. Incidentally it was of interest that both Harvey and Sharpey were born in the same town, Folkestone, although at an interval of more than 200 years. The President then welcomed the members of the Congress on behalf of the countrymen of Harvey and Sharpey and Lister, and noted with regret the loss of 22 workers in physiology or allied subjects who had died since the last Congress was held, among them being F. A. Bainbridge. Wilhelm Hofmeister, François Franck, and Augustus Waller. It was fortunate, he said, that the president of a physiological congress was not expected to give an account of the progress of the science since the preceding meeting. The task would, indeed, be a difficult one in view of the complexity of the science and the small part of it any one person could be expected to master. There was, however, a particular subject which was arousing an extraordinary amount of interest, not only amongst physiologists and physicians, but amongst the general public. The subject concerned the internal secretion of the pancreas and was especially connected with the activities of the Toronto School. On this account the Committee of the Congress had invited Dr. J. J. R. Macleod, the distinguished professor of physiology in the University of Toronto, to lecture to the Congress on Insulin. The President then invited Prof. Macleod to read his address, of which an abridged version will be found on p. 198 of our present issue.

THE ADMINISTRATION OF THE VACCINATION ACTS.

THE present epidemic of small-pox in parts of the country emphasises the importance of securing the proper administration of the Vaccination Acts, and the necessity of ensuring that exemption from vaccination is only obtained in conformity with the law. The Minister of Health has issued to boards of guardians a statement of the legal provisions in this connexion ; cases have been brought to his notice in which statutory declarations of conscientious objection to vaccination have been accepted by vaccination officers, although they have been made by some person other than the legal guardian of the child, and various other irregularities have occurred which, he is advised, render the statutory declaration of no effect. In some districts the prosecution of defaulters has entirely ceased. The statement points out the following facts :—

> In ordinary circumstances the father is the person having the custody of a legitimate child, and the obligation therefore rests upon him unless, by reason of his death, illness, absence or inability, or for any other cause, the mother or some other person has the custody of the child. The Vaccination Act of 1907 provides that no parent or other person shall be liable to any penalty under Section 29 or Section 31 of the Vaccination Act of 1867 if within four months of the birth of the child he makes a statutory declaration that he conscientiously believes that vaccination would be prejudicial to the health of the child, and within seven days thereafter delivers or sends by post the declaration to the vaccination officer of the district. It is clear, therefore, that if the father has the legal custody of a child and neglects to cause the child to be vaccinated, he is not exempt from penalty unless he himself makes a declaration of conscientious objection.

The Minister considers it important that vaccination officers should be accurately informed as to the law on this point, and that the responsibility of parents and guardians should be made absolutely clear. The statement also points out that a vaccination officer should scrutinise every statutory declaration which he receives with a view to satisfying himself that the declaration is in all respects in order, and that the duty of taking proceedings for enforcing the provisions of the Vaccination Acts is imposed upon vaccination officers without any directions from the Ministry or the guardians, but it enjoins that the guardians should ascertain from time to time whether those officers are performing these duties, and report to the Minister any case of continued neglect on the part of a vaccination officer. In present circumstances the Minister considers it essential that proceedings should be taken in every case of default.

An Order has been made under the Vaccination Acts prescribing a new form of notice of the requirement of vaccination, in substitution for Form A contained in the First Schedule to the Vaccination Order (No. II.), 1907. The effect of the Order is to eliminate from Form A the form of statutory declaration, and to provide that forms for this purpose may be obtained from vaccination officers. The Order will come into operation on Sept. 1st next, and the necessary forms will shortly be forwarded to registrars of births and deaths, and to boards of guardians for distribution to vaccination officers.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXX.—THE TREATMENT OF THE HYPERTROPHIED PROSTATE.

A man with a hypertrophied prostate presents a more difficultly soluble problem in treatment than a superficial examination of his condition would lead us to expect. On the one hand, it has now been indisputably proved that the average expectation of life is greater amongst those patients who submit to operation under modern conditions, whilst, on the other, it cannot be denied that there is an immediate mortality which is probably larger than we are apt to recognise, our judgment being influenced on the favourable side by the perusal of the results of a very limited number of master operators. The prostatic's troubles are at first purely a local mechanical disturbance of bladder action, but when the kidneys become damaged by being compelled to secrete against great pressure, a disturbance of function of every vital organ in the body supervenes. There is a toxæmia from imperfect elimination, from the effects of which no tissue can escape. The kidneys are damaged most, so that there may not be the slightest reserve on which to call to face the exigencies of the most simple operative procedure. The muscular power of the heart is diminished, whilst the lungs, partly from the lowered circulatory efficiency, and partly from the depressed power of resistance, which they share in common with all other tissues, are prone to suffer from infective lesions. The prostatic is a generally ill man, and often, despite his apparently healthy condition, is living precariously on the brink of a catastrophe, which may be precipitated, only too surely, by ill-timed or ill-advised surgical treatment.

The Choice Between Catheter Life and Operation.

Since it is exceptional for a catheter to be used for any length of time with impunity, catheter life should never be recommended, unless there is some very serious and irremovable objection to operation, such as the presence of diabetes, advanced heart disease, carcinoma, hemiplegia, or other grave illness.

At what stage of the disease does it become necessary to advise operative treatment, or, as the case may be, catheter life? The answer to this is: 1. When the obstruction to the passage of urine has thrown such a stress upon the bladder musculature as to cause it to lose its power of obliterating completely the lumen of this viscus, and of closing the orifices of the ureters during micturition. This is usually the case when the residual urine amounts to about three ounces. 2. When the patient's health is being undermined by being awakened from sleep at frequent intervals for the purpose of micturition, a condition of bladder irritability which is sometimes set up by a prostatic adenoma still small in size and not causing very great urinary obstruction. Where the residual urine is only one or two ounces, relief may be given to the patient if he follows a careful régime, avoiding exposure to cold and damp, and the use of alcohol and highly flavoured foods; he must not overwork and must have a sufficiency of sleep. But always before acceding to this line of treatment it must be determined by appropriate tests that serious general damage has not already taken place.

If, perforce, catheter life must be installed, it is preferable that the patient should have a male attendant who can carry out the necessary manipulation with all regard to aseptic dictates; but should this not be possible, the patient should receive meticulous instructions in the technique of catheterisation. Gum-elastic coudé catheters are the best. When there is little residual urine and a fair power of expulsion remains, two passages of the catheter in 24 hours will suffice, one immediately before retiring to bed. After use the catheters should be washed, drained, dried, and placed in a tube, in the bung of which is a compartment containing paraform powder, for 24 hours. Therefore two, or better three, sets of catheters, should be provided. Another method of sterilising, about equally effective and equally troublesome, is by *boiling*. The new gum-elastic catheters will stand *boiling* for a short time, 1–2 minutes. A portable boiler in which the catheters hang suspended can be obtained. As a lubricant a jelly containing tragacanth and oxycyanate of mercury is recommended. This can be obtained sterilised in collapsible tubes. When there is no voluntary power of passing urine, so that many catheters are necessary, or when the passage of a catheter is impossible or painful for the patient, it is better to make permanent suprapubic drainage under local anæsthesia, and to provide him with an attachment for collecting urine. In most patients the consideration of operative removal comes to the fore.

Examination Preliminary to Prostatectomy.

In connexion with the actual operation of prostatectomy there are certain outstanding features. The bleeding cannot be controlled exactly as it can, for instance, in a gastro-jejunostomy, whilst the total amount of blood shed cannot be foretold; a rather ragged cavity is left, during the healing of which necrosed tissue must be absorbed and throw a strain upon the excretory organs; sepsis of the cavity inevitably occurs, though to a variable degree. We must, therefore, determine, as far as we can, the reserve powers of two great systems, the circulatory and excretory. Will the heart be able to maintain the circulation after the loss of blood which must occur in connexion with the operation? Are the kidneys working up to the limit of their capacity or will they be able to carry on when the autolysed products of destroyed tissue are absorbed into the blood-stream? Will the immunity response of the patient be equal to dealing with the inevitable infection? We have no direct measure of the powers of defence to infection, but we can carry out investigations which will help us to judge of the efficiency of the circulation and excretory apparatus. We should try to ascertain: (1) The reserve power of the heart; (2) the hæmoglobin value of the blood; (3) the blood pressure; (4) the quantity of urine passed in 24 hours and its specific gravity; (5) the reserve power of the kidneys. An index of the resources of the heart is the reaction of the patient to exertion, the presence or not of dyspnœa after a moderately sharp walk or on going upstairs. We can get no exact measurement of this function in reserve; we can only arrive at a clinical impression. Loss of blood will mean increased work for the heart. The higher the blood pressure, the less able will the heart be to respond. The toxæmia which results from the damage to the kidneys, as in chronic interstitial nephritis not dependent upon disease of the prostate, affects the bone-marrow and interferes with the birth of new red corpuscles. The patient is doubly handicapped to withstand a hæmorrhage; he suffers from anæmia to begin with and is crippled in his efforts to replace the lost red corpuscles. If the hæmoglobin percentage is below 60, it is a risky procedure to attempt a prostatectomy. Polyuria with low specific gravity and low urea content points to the existence of chronic interstitial nephritis. By flooding the circulation with urea and thus throwing a strain upon the kidneys we are able to estimate their reserve power. H. Maclean's urea-concentration test is the simplest, most practical, and most reliable method of doing this. If, in response to this test, the kidneys are able to secrete urine containing 1·5 per cent. of urea, they are not likely to fail after operation, and a considerable number of cases can be operated upon, other factors being favourable, if the percentage of concentration is down even to one. The phenolsulphonephthalein test of renal function is also useful, but is less simple and reliable.

The Institution of Preliminary Drainage.

If the tests are unfavourable to operation, it is possible to improve the patient's condition so that eventually he may be submitted to it without undue risk. The secret of such treatment is to relieve the pressure against which the kidneys have to secrete, leaving the prostate in situ. This is done by an in-dwelling catheter, or by suprapubic drainage. It is astonishing what recovery will take place from this treatment. A catheter should be tried first. Suprapubic drainage should be instituted (1) if catheterisation is impossible; (2) if the urethra will not tolerate an in-dwelling catheter; (3) if there is much urinary sepsis; (4) if the period of drainage has to be a prolonged one. Ten days or a fortnight of drainage will often suffice materially to improve the urea-concentration figure, but sometimes a delay of several months is necessary before prostatectomy can be safely undertaken. A word of caution must be given about the management of cases where there is much residual urine or overflow incontinence. Evacuation of the bladder must be gradual or uræmia may quickly follow. In such patients either a catheter should be passed every four hours and a pint of urine withdrawn until the bladder is empty, when a catheter may be tied in, or, what amounts to the same thing, a catheter is tied in the urethra and the plug removed every four hours to evacuate the same amount. Should suppression of urine follow a too rapid emptying, the symptoms of uræmia may be induced to disappear by filling up the bladder again with boric lotion.

Certain complications, such as retention of urine, hæmorrhage, and epididymitis, may occur in the prostatic; space forbids discussion of their treatment. For retention a hot bath, with hypodermic of morphine gr. ½, should first be tried, followed by gentle attempts at catheterisation; aspiration above the pubes or the insertion of a self-retaining catheter into the fundus of the bladder are last resorts. Rapid removal of urine is dangerous.

The Choice of Method for Removal of the Prostate.

It is not possible to say at present which is the better of the two methods; advocates of both exist and almost equally good statistics have been published. The suprapubic operation is certainly easier and the results are in the main good. In the hands of experts the perineal operation appears to show a slightly lower mortality and to afford better opportunity of controlling hæmorrhage; certainly drainage of the septic prostate cavity is more efficient. The two great drawbacks cited against the procedure, incontinence and urethro-rectal fistula, disappear with the increasing skill of the expert. The presence of a stone in the bladder, discovered by cystoscopy, which should always be performed when practicable, indicates the suprapubic route.

The Results of Prostatectomy.

The urinary fistula, perineal or suprapubic, is usually closed within three weeks and the patient returns to a state of health unknown to him for years. Some patients, however, still complain of a certain nocturnal frequency of micturition. A much more troublesome condition is the persistence of sepsis, from which the patient never recovers. In such individuals it is probable that the kidneys were badly infected at the time of the operation. Not very commonly a stricture follows the enucleation of a prostate. The obstruction is sometimes at the triangular ligament, at others at the bladder base, and may need a cystotomy for its proper treatment. On the whole, however, it may be said that the ultimate results of removal of the prostate are extremely good. They are incomparably better than partial excisions done by intra-urethral instruments. Recently a revival of such incomplete removal has taken place, substituting the diathermic cautery for the punch or actual cautery. It would be premature to criticise the results of such a recent technique, but the indications are that, like the older methods, it has only a limited application.

CHARLES A. PANNETT, M.D., B.S.Lond., F.R.C.S.Eng.
Professor of Surgery, St. Mary's Hospital Medical School.

Special Articles.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

THE annual summer gathering of the British Medical Association opened under ideal weather conditions at Portsmouth on Friday, July 20th, when the Representative Body held its first session in the Municipal College, adjoining the Town Hall.

CIVIC WELCOME.

At an early stage in this session the Lord Mayor of Portsmouth, Alderman F. G. FOSTER, attended to bid hearty welcome to the Association. He was introduced by the President-Elect, Mr. C. P. CHILDE, F.R.C.S., who pointed out that it was the Lord Mayor to whom, as chairman of the Education Committee, the loan of the College was due. Mr. Childe also introduced Mr. C. A. SCOTT RIDOUT, F.R.C.S., hon. local general secretary, as the pivot on which the whole meeting was to revolve. Alderman Foster said that it was his brother, the late Sir Scott Foster, who had extended the civic welcome to the Association at its last meeting at Portsmouth in 1899. He spoke of the growing public interest in health during the intervening 24 years, telling of the local wiseacre who complained of "that fool of a medical officer sniffing round, when here I have been living in Milton for 40 years and never seen a microbe." Dr. R. WALLACE HENRY, chairman of the Representative Body, said that the Association had three great aims: first, the consolidation of medical knowledge and the finding of new methods by which disease might be cured and its incidence prevented; secondly, to discover the best methods by which advances in medical science might be passed on to the public; and thirdly, to secure to those engaged in the work such conditions, economic and other, as would free them from needless anxiety and enable them to put forth their best work. It had been said that good work was its own reward; he would add that better work came from better reward.

REPRESENTATIVE MEETING, FRIDAY, JULY 20TH.

Dr. WALLACE HENRY, of Leicester, took the chair at 10 A.M. After apologies for absence and the acceptance of certain modifications in the standing orders, Mr. J. Basil Hall, M.Ch. Camb., was elected President of the Association for 1924–25, the annual meeting of 1924 to be held at Bradford. The annual meeting of 1925 was fixed for Bath. Sir David Drummond, president in 1921–22, was elected a vice-president, as also Mr. G. A. Syme, M.S., of Melbourne, chairman-elect of the Australasian Medical Congress, Dr. R. H. Todd, of Sydney, Dr. H. E. Gibbs, hon. secretary of the New Zealand branch, Dr. W. Watkins-Pitchford of Johannesburg, and Dr. D. C. Watt of Pietermaritzburg. It was announced that Sir William Macewen was going in November as ambassador to the Australasian Congress.

PUBLIC HEALTH POLICY OF THE B.M.A.

The meeting at once settled down to consider the relations between the British Medical Association and the Society of Medical Officers of Health. These had been under discussion since the Cambridge meeting in 1920, and the negotiations had resulted in the drawing up of a definite scheme described by Dr. R. A. BOLAM, chairman of the B.M.A. Council, as an agreement between the medical profession as a whole and those who have the duty of carrying out public health functions under authority. There is at present no provision in the constitution of the Association for ensuring that the opinions of members working as whole-time officers for public health authorities shall be made known directly to the Association, and the B.M.A. Council, in the course of its investigations, became convinced that it would be for the good of all if representatives of the public health service were brought into direct contact with people doing other kinds of medical work. First, the report of a conference of representatives of the two bodies was submitted for the approval of the meeting. This report runs as follows:—

Report of Conference between B.M.A. and Society of M.O.H.'s on Public Health Medical Services.

I. The Conference has reviewed the obligations and powers imposed and conferred upon local authorities by Acts of Parliament in regard to health administration and the relative position of medical officers of health and general practitioners in schemes of health services. These obligations and powers include:—

(a) Medical survey or inspection.

(b) Treatment.

II. Local authorities must give effect to their legal obligations. The extent to which they exercise their powers is in the discretion of the local authority subject to the prior approval of the appropriate central Government department. The Conference is of opinion that benefit would be likely to result from a closer coöperation of the local medical profession with the local authorities' schemes of medical survey or inspection and treatment.

III. The Conference is in general agreement with the view of the Consultative Council on Medical and Allied Services as stated in that part of paragraph 6 of its interim report which recited:—

"Preventive and curative medicine cannot be separated on any sound principle and in any scheme of medical services must be brought together in close coördination. They must likewise be brought within the sphere of the general practitioner, whose duties should embrace the work of communal as well as individual medicine."

Advice to Local Authorities.

IV. The Conference is therefore prepared to advise local authorities:—

(1) That where private general practitioners place their opinions before local authorities on any proposed scheme of medical survey or inspection and treatment, their representations should have due consideration by the local authority in order that it may be ascertained how far it is practicable or desirable to give effect to their view.

(2) That those engaged in general practice must either be prepared to accept responsibility for the treatment of such of their private patients as are discovered by medical survey or otherwise by the local authority to be in need of treatment, or they should agree that treatment should be undertaken by the local authority without regarding such medical provision as an encroachment on their practice. To this end persons found to be in need of treatment should, in the first instance, be referred to their private medical practitioner, or if they have no regular medical attendant they should be advised to consult a private medical practitioner.

(3) Private practitioners should assist local authorities by intimating their willingness or otherwise to undertake the treatment of patients discovered in the manner stated to be in need of treatment.

Centres and Clinics.

V. That practitioners, and by arrangement medical students, should have access to centres and clinics established by local authorities, in order that they may gain such experience as the centres and clinics afford.

VI. That private medical practitioners should be able to refer to clinics and centres for advice and treatment patients who would thus be most appropriately provided for.

VII. That payments or charges, if any, made in respect of medical treatment should be either voluntary or of such a character as will not deter persons from seeking advice and obtaining early treatment.

VIII. Centres and clinics should be established and administered for the benefit of:—

(a) Those who are unable, for some reason, to obtain treatment from a private doctor, and

(b) Those who, as a result of supervisory medical work undertaken by the local authority, are discovered to be ailing, and for whose ailments treatment would not be sought unless it were provided by the local authority.

But treatment at centres and clinics should be such as can be actually given therein, and should not include any treatment that makes domiciliary attendance advisable or involves a stay of more than 48 hours at any clinic where beds are provided.

Treatment by Private Practitioners.

IX. The Conference is of opinion that in the interests of harmonious working and the acquirement of clinical experience, the possibility should always be considered of clinical work done for the public health authority being carried out through the agency of private practitioners where conditions are suitable.

X. For the purpose of a better understanding, the Conference desires to state further:—

(1) That private general practitioners or consultants accepting offices under local authorities must realise that the duties of these offices require to be fulfilled strictly in accordance with the conditions of the appointments and in priority of all other engagements.

(2) That the health policy is settled by local health authorities, not only on medical grounds, but after due regard has been given to the closely-related questions of administration and finance, local conditions and other relevant considerations.

(3) That the medical officer of health should so far as possible secure the coöperation of the local medical profession in the discharge of his duties.

(4) That the final decision of the health policy must always rest with the local central authorities.

(5) That it is the duty of the medical officer of health to ensure that effect is given to the decisions of those authorities.

Scheme for Coöperation with M.O.H.'s.

This report was agreed to without further discussion. Dr. Bolam then proposed certain alterations in the constitution of the B.M.A., involving corresponding alterations in the constitution of the Society of M.O.H.'s, the whole being a contingent agreement which precluded the Society of M.O.H.'s from independent medico-political action. The recommendations of the B.M.A. Council were as follows:—

I. (a) The B.M.A. so to alter its constitution as to allow of the *direct* representation of such of its members as are in the Public Health Service, on its various governing bodies; and

(b) The Society of M.O.H.'s so to alter its constitution as to allow of the Association being directly represented on the Council of each branch and on the Central Council of the Society.

Note.—It is eminently desirable that the representatives on the Council of the Association, or Society, should be members of the other Council.

II. The Society of M.O.H.'s to continue to formulate and urge any medico-political policy that it wishes, and where such policy is of mutual concern to both the Society and the B.M.A., the Society will present that policy to the Association through its direct representatives, and when any such medico-political matter has been finally determined by the annual representative meeting all action consequent thereon shall be taken by the B.M.A. The Society shall refrain from taking any action in support of a divergent policy until after the decision of the annual representative meeting, but in the event of the Society thereafter feeling constrained to consider the taking of separate action, such action shall not be taken until the Councils of the Association and the Society have conferred together thereon.

III. As a condition of, or preliminary to any agreement on the above lines, *if desired*, a common declaration of policy on general lines to be promulgated by both Association and Society, and a common arrangement in general terms as to certain points with regard to salaries and the method of securing them to be agreed upon.

Prolonged discussion took place on this scheme, started by an amendment from Brighton, disapproving of any alteration in the constitution of the B.M.A. which would secure for certain of its members dual facilities for voting and representation. The Association, it was argued, had been built up on an individual basis, and to change this was to go back on the democratic attitude of 1902. If 1800 public health service members were given special privileges, the same would be claimed by other groups such as Poor-law, insurance, medical women, service branches, and so on. The B.M.A. Council frankly admitted the small sacrifice of democratic principle involved in the bargain, but justified it as the only practical way of preventing the public health medical service from ploughing its own lonely furrow or combining for political action with administrative branches of the health service. The meeting agreed with the Council by refusing the Brighton amendment and passing the change in constitution by the necessary two-thirds majority.

Scale of Minimum Salaries for P.H. Medical Officers.

A definite scale[1] of minimum commencing salaries for medical officers in the public health service was then put to the meeting by the chairman of the B.M.A. Council. This scale differs substantially from that submitted at Cambridge in 1920. In its earlier form current civil service bonus and yearly increases were integral portions of the scheme. In view of the present economic position these are now accepted as guiding principles but are not obligatory. The minimum commencing salary for a junior officer has been meanwhile raised from £500 to £600, inasmuch as it was shown that progressive health authorities were now requiring evidence of special experience before a practitioner could hope to get on the short list for one of the junior appointments. The M.O.H. of a large county, with a staff of nearly 30, stated that the average age of his juniors on appointment was nearly 40, and that only one of them (appointed during the war) was without special experience on appointment. The B.M.A. Council came to the conclusion that if this special experience was to be made a sine qua non for appointment, it could not be suggested that £600 was an extravagant salary, particularly as the prospect of advancement is poor. The scale as now proposed also differs in the greater differentiation in the salaries for the chief M.O.H., to begin at £800 for a population of under 35,000—the great bulk of appointments being between £800 and £1100.

Dr. BOLAM, in moving this scale, pointed out again that much had been said regarding £600 as a commencing salary for a "young raw graduate," but this term no longer described the public health service entrant, for he or she must be fully qualified (six years) plus the D.P.H. plus special experience in some department—e.g., tuberculosis, school hygiene, M. and C.W., and was then years removed from qualification. The chances of getting £1000 or over in the service were small; he put them at 1 in 8 (wishing to be moderate); Dr. C. SANDERS at 1 in 14. The motion was carried by the necessary two-thirds majority. The Council then accepted an instruction to meet representatives of local authorities and to make such alterations in detail as might be necessary to secure an agreed scale.

Amendments in the by-laws were then passed rendered necessary by the decision to admit direct representation of public health service members on the governing bodies of the Association, the following interpretation being accepted:—

The expression "public health service member" means a member of the Association who is permanently employed in the whole-time medical service (other than service at a lunatic asylum) of the council or education authority of any county, county borough, municipal borough, metropolitan borough, burgh, urban district, rural district, or parish, or port sanitary authority in the United Kingdom.

Medical Defence for Members of the B.M.A.

On a motion by Warrington and St. Helens—

regretting that the B.M.A. Council had not seen its way to recommend the alteration of the Articles of the Association so that this paramount duty might be undertaken either by the Association itself or by its incorporation with one or

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[1] *Minimum Commencing Salaries for Public Health Medical Officers.*

RESIDENT MEDICAL OFFICERS .. .. .. DEFINITION.—These are Medical Officers employed in Hospitals, Sanatoria, or other Institutions without responsibility for the work of other Medical Officers. *Note.*—Where the Appointing Authority limits the appointment to a term not exceeding one year and not renewable, this salary shall not apply.		£350 plus emoluments.
MEDICAL OFFICERS EMPLOYED IN DEPARTMENTS. DEFINITION.—These are Medical Officers without responsibility for the work of other Medical Officers, but who shall have had at least three years' experience in the practice of their profession subsequent to obtaining a registrable qualification.	Working directly under a Senior Medical Officer.	£600
SENIOR MEDICAL OFFICERS IN CHARGE OF DEPARTMENTS—e.g., Port Sanitation, School Medical Departments, Tuberculosis Departments, Mental Deficiency Departments, Maternity and Child Welfare Departments, Venereal Disease Departments, or any other similar department or combination of departments, and Medical Superintendents of Hospitals, Sanatoria, or other Institutions. DEFINITION.—These are Medical Officers who are in charge of departments and are directly responsible to the Medical Officer of Health or otherwise.	Without Assistants.	£750
	With 1 Assistant	£900
	2	£950
	3	£1000
	4	£1050
	5–6	£1100
	and for every completed two or less.	an additional £50
DEPUTY, OR CHIEF ASSISTANT, MEDICAL OFFICERS (Hospitals, Sanatoria, or other Institutions and Departments).		A salary equal to 60 per cent. of the salary of the Medical Superintendent or Senior M.O. in charge but not less than the salary of a M.O. employed in a department.
DEPUTY OR ASSISTANT MEDICAL OFFICERS OF HEALTH. DEFINITION.—A Deputy or Assistant Medical Officer of Health is a medical officer duly appointed as deputy or assistant medical officer of health by the local authority to assist the medical officer of health in the general administration of the health department and the carrying out of the various Acts, by-laws, orders, rules, regulations, &c., required to be or usually administered by the medical officer of health; the title deputy assistant medical officer of health to be limited to medical officers carrying out these general duties.		A salary equal to 60 per cent. of the salary of the M.O.H. but not less than the salary of next grade of medical officer in the department.

—	Population.	Minimum commencing salaries per annum.
MEDICAL OFFICERS OF HEALTH	Under 35,000	£800
	,, 50,000	£900
	,, 75,000	£1000
	,, 100,000	£1100
	,, 150,000	£1200
	,, 200,000	£1300
	,, 300,000	£1400
	,, 400,000	£1500
	,, 500,000	£1600
	,, 600,000	£1700
	Over 600,000	£1800

Notes.

(A) These salaries are net, any expenses necessitated by the duties being provided in addition.

(B) Population means population at the latest annual report of the Registrar-General.

(C) No existing officer should be prejudicially affected by the operation of the scale.

(D) ANNUAL INCREMENTS should be at the rate of 5 per cent. per annum, rising to 40 per cent. above the minimum basic rates.

(E) BONUS. The current Civil Service cost of living bonus should be applied to the foregoing scales.

(F) That the salaries of Medical Superintendents of Poor-law Hospitals should be as for Senior Medical Officers in charge of Departments as set out above.

(G) That salaries are to be minimum salaries for *whole-time* service.

(H) That Medical Superintendents of Institutions, and in suitable cases Chief Assistant M.O.'s, should, in addition to their salaries, be supplied with a house.

(I) That there shall be no differentiation of salary on account of sex.

(J) That all exceptional work not recognised as normal duties to the subject of additional remuneration.

(K) That if marriage be deemed by the local authority a disqualification for a medical appointment the same shall be specifically stated when the vacancy is advertised.

(L) That in placing existing officers in accordance with these salaries, years of service and merit should receive recognition.

(M) That all Medical Officers of local authorities should be subject to similar security of tenure as is provided for a Medical Officer of Health under the Public Health (Officers) Act, 1921. But where the appointing authority limits the appointment to a term not exceeding one year, and not renewable, this provision shall not apply.

became convinced that it would be for the good of all if representatives of the public health service were brought into direct contact with people doing other kinds of medical work. First, the report of a conference of representatives of the two bodies was submitted for the approval of the meeting. This report runs as follows :—

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Prolonged discussion took place on this scheme, started by an amendment from Brighton, disapproving of any alteration in the constitution of the B.M.A. which would secure for certain of its members dual facilities for voting and representation. The Association, it was argued, had been built up on an individual basis, and to change this was to go back on the democratic attitude of 1902. If 1800 public health service members were given special privileges, the same would be claimed by other groups such as Poor-law, insurance, medical women, service branches, and so on. The B.M.A. Council frankly admitted the small sacrifice of democratic principle involved in the bargain, but justified it as the only practical way of preventing the public health medical service from ploughing its own lonely furrow or combining for political action with administrative branches of the health service. The meeting agreed with the Council by refusing the Brighton amendment and passing the change in constitution by the necessary two-thirds majority.

refer to the consideration of the Council the following points for definite decision next year with such interim action as was within the present range of its hospital policy :—

> (*a*) The income limit scale to be such as is approved by the majority of the medical profession resident and practising within the area of the scheme.
>
> (*b*) Free choice of doctor (attendant and specialist) by patient subject to consent of doctor to act.
>
> (*c*) The scheme to be administered by a general committee representative of the interests concerned, and not by a voluntary hospital or other coöperating institution.
>
> (*d*) The method of remuneration of medical specialists to be payment for work done.
>
> (*e*) Medical remuneration for specialist's services to be what the local profession considers adequate having due regard to the services to be rendered and other conditions of the scheme.
>
> (*f*) Adequate medical representation of the General Committee administering the scheme with recognition of the Division (Branch) of the British Medical Association as representative of the profession in the area of the scheme.
>
> (*g*) The accommodation provided for in-patient treatment to be at recognised nursing homes, paying hospitals, or in *accommodation* of the nature of a nursing home in connexion with a voluntary hospital.

—these proposals being based on the fundamental points adopted for domiciliary National Health Insurance.

The British Medical Journal.

The B.M.A. Council reported that this year Sir Dawson Williams completes 25 years' editorship of the *British Medical Journal*. It was resolved and carried by acclamation—

> That this meeting sends its heartiest congratulations to Sir Dawson Williams, upon the completion of his 25 years as Editor of the *British Medical Journal*, and wishes him health and success in carrying on that work.

To signalise the occasion Sir Dawson Williams is to be the guest of the evening at the B.M.A. Council dinner on Oct. 24th.

Scientific Work of the B.M.A.

In asking for approval of the section of the annual report under the heading Science, the chairman of the Science Committee, Mr. H. S. SOUTTAR, spoke of the peculiar character of the Association's research scholarships, in that scholars were not required to devote the whole of their time to research, but might hold concurrently junior appointments at university or hospital. The Council was proposing to make additional grants for approved schemes of post-graduate education undertaken by the branches. He referred to the valuable work of Mr. W. G. Spencer as honorary librarian, and of Prof. R. T. Leiper in preparing the "Bibliographical Index." He hoped that the new home of the Association would prove a centre for exchange of scientific ideas. Mr. E. B. TURNER thought that now war conditions were passing more money should be given by the Association for "direct culture." He had been struck by the high qualification and claims of the candidates for scholarships.

Representation of Medical Women's Federation on the B.M.A. Council.

A motion was proposed by Dr. BRACKENBURY and seconded by Dr. CHRISTINE MURRELL (Kensington) to the effect—

> That the Council be instructed to prepare the necessary alteration in the by-laws to allow the coöption to the Council of a member of the Council of the Medical Women's Federation nominated by that body, and that in the meantime the Council should invite a representative of the Council of the Medical Women's Federation to attend its meetings.

Dr. Brackenbury said that for many years the M.W.F. had worked in complete harmony with the B.M.A. on matters of medical policy, and members of the M.W.F. had been coöpted on subcommittees of the B.M.A. He regarded the claim for special representation as valid, because (1) the M.W.F. formed a distinct body of practitioners with separate professional interests and ideas, (2) it was sufficiently numerous to justify representation, and (3) so scattered that representation on the usual lines was hardly feasible. But the motion he was putting might be too precise and categorical. Dr. Murrell said that while medical women did not desire as such any special franchise, nevertheless society forced upon them the separate consideration of certain matters, and it was then inconvenient for one council not to know what the other council was doing. Some method was required of solving a practical difficulty. Dr. C. O. HAWTHORNE (Marylebone) characterised the demand as simply one of sex representation without any element of vocation or reciprocity. A federation of red-haired practitioners would have an equal claim for special treatment. Dr. MACKENZIE besought the meeting not to go back on its Newcastle decision to reject a federal basis; it would certainly be a good thing to have a woman elected on the B.M.A. Council, but not for the M.W.F. to have a seat there by right. The Association already had 1300 women members while the Federation had but 800.

By consent of the meeting the original motion was withdrawn in favour of one proposed by Dr. E. W. G. MASTERMAN (Camberwell) and seconded by Mr. SOUTTAR—

> That the Council be instructed to investigate what measures can be taken to ensure some means of representation of medical women on the Council of the Association.

This motion on being put to the meeting was lost by a large majority.

Public Health Matters.

A motion proposed by Dr. C. J. KIRK (Darlington)—

> That the Council of the British Medical Association inform the Ministry of Agriculture and the Ministry of Health that in the opinion of the British Medical Association the Milk and Dairies Act, 1915, and the Tuberculosis Order, 1913, should be brought into operation at the earliest possible date,

was referred for consideration to the Council which was also requested, on the proposition of Dr. H. ROSE (Bucks) to call the attention of the Ministry of Health to the urgent necessity of isolating cases of advanced and infectious tuberculosis.

On a motion by Dr. J. W. BONE (Bedfordshire) it was resolved to express regret that "Summer Time" has been curtailed this year, as the British Medical Association is of opinion that it is beneficial to the health of the nation.

Mr. E. B. TURNER (Kensington) proposed, Dr. T. W. H. GARSTANG (Mid-Cheshire) seconded, and it was unanimously resolved—

> That the Representative Meeting restates the policy of the Association, and the practically universal conviction of the medical profession, that vaccination efficiently performed in early infancy, and repeated after such intervals as may be deemed necessary during after-life, is the only certain preventative of small-pox. Owing to the distribution of an enormous number of unvaccinated persons in every part of the Kingdom it recognises the danger of a pandemic of this disease, and therefore urges the Government to take such measures—legislative, administrative, and preventive—as may be necessary to avert this peril from the community and should it do so, assures it of the whole-hearted support of the British Medical Association.

As a corollary to this resolution it was proposed by Dr. NOY SCOTT (Plymouth), seconded by Dr. H. L. HATCH (Harrow), and agreed that Government lymph should be supplied during an epidemic to all medical practitioners who apply for it and are willing to render a report on the results. Dr. J. A. MACDONALD expressed his belief that the Ministry of Health would readily grant this if the claim were pressed.

National Health Insurance.

Under this heading Dr. BRACKENBURY obtained from the meeting endorsement of the policy and action of the Insurance Acts Committee (see THE LANCET, 1923, i., 1226). The meeting firmly refused, by proceeding to the next business, to discuss Dr. FOTHERGILL'S amendment to the effect that the organisation of insurance practitioners (set out in a rather famous document known as M. 10) in the event of a refusal of the Government's terms was contrary to the honour and interest of the medical profession. Dr. Brackenbury did not believe that the contingency would arise. The attempt to define the

> more of the existing defence societies; further, that this meeting is of opinion that the individual defence of members in professional matters should be one of the functions of the Association,

Dr. J. S. **Manson** reminded the meeting that the matter was first discussed in 1896, was the subject of resolutions at Swansea in 1903, and at Newcastle in 1921. The Wood-Hill case had given great impetus to the demand for individual defence. There was a very strong expression of opinion that it was the function of the Association to protect its own members. But the solicitor to the Association pointed out that (1) legally the Memorandum of Association did not include individual defence, and the Home Office would have to be approached for permission to apply to the courts for alteration of the constitution; and (2) existing defence societies were so well established that it was now hardly practicable to get individual medical defence within one fold. The motion was lost by a large majority.

Election of Members of Council.

The election of 12 members of Council by grouped representatives was announced as follows: Dr. G. B. Hillman, Dr. F. Radcliffe, Dr. J. W. Bone, Dr. T. Ridley Bailey, Mr. W. McAdam Eccles, Dr. W. Paterson, Dr. C. E. S. Flemming, Dr. S. Morton Mackenzie, Dr. C. E. Douglas, Dr. J. McGregor Robertson, Dr. R. B. Mahon, Dr. J. S. Darling; all being unopposed except Dr. Flemming and Dr. Douglas.

The meeting adjourned at 6 p.m.

Representative Meeting, Saturday, July 21st.

Hospital Policy of the B.M.A.

On Saturday morning the report of the B.M.A. Council on hospitals was taken, in order to give the meeting an opportunity of discussing the policy of the Association with regard to

Contributory Schemes

of hospital benefit. After an expression of regret at the loss by death of Sir James Galloway, a valued member of the Hospitals Committee, a motion by the chairman of the Hospitals Committee, Mr. N. **Bishop Harman**, to define (for the purpose of the present discussion) a contributory scheme as "a scheme to which contributions are made for which there is to be a stated or implied return," was carried. Mr. Harman showed how wide an interest had been created by hospital policy of the Association enunciated last year at Glasgow. A motion by Buckinghamshire to the effect—

> That unless it can be clearly shown that the amounts collected for hospital benefits by contributory schemes are in excess of the amounts required for the upkeep and maintenance of the hospital, no part of the moneys thus collected can fairly or properly be claimed by the honorary medical staff,

led to animated discussion on the purpose for which the individual pays his contribution; in practice it was generally regarded as impossible to distinguish between payment for maintenance and payment for treatment. The worker's attitude to the hospital doctor was apt to be "We pay 1*d*. a week, we buy *you*." And Mr. H. S. **Souttar** said it was perfectly clear that the contribution was paid "for treatment in hospital." In a genuine contributory scheme Mr. Harman contended there was no difficulty in finding money for both, but the Hospital Savings Association was simply a means of exploiting the medical profession. The motion was lost.

Medical Staff Funds.

Mr. **Harman** then moved the amendment of a paragraph in the Hospitals Report so as to read:—

> Income derived from gratuitous contributions, existing assets, endowment funds, and the like, are not liable to assessment for medical staff fund purposes, but all payments made for hospital benefit are, in fact, payments towards all the services of the hospital whether medical or ancillary, and therefore a percentage of such payments should be passed into a fund which is at the disposal of the honorary medical staff of that hospital. Small payments of individual patients not recoverable from third parties may be assessed in a nominal percentage only as a token recognition of the policy enunciated.

"They do, in fact, pay to see the doctor," said Mr. Harman in his brief introductory statement. An amendment was moved by Reigate to the effect—

> That, in the absence of any great body of opinion to show that the members of the Association, and more particularly members of the medical staffs of hospitals are in favour of the policy laid down in the Hospital Report, the further consideration of the policy proposed be postponed until next annual representative meeting; and the Council be instructed to inquire in the meanwhile of all staffs of hospitals with 30 beds and over, which of the various sources of income, if any, of a hospital should be required to make a contribution towards a staff fund.

Dr. S. **Morton Mackenzie**, in moving postponement, said that the policy might be sound, but it was better to go slow, for many members of voluntary hospital staffs would certainly refuse the "token recognition" or any other.—Sir **Richard Luce** called attention to the difficulties caused by varying conditions in the North and South. In the North a large part of the hospital funds came from workmen's contributions collected at the source and was untaxable under the resolution; in the South payment was directly made by patients and could be taxed. The capitation fee of insurance and friendly societies was on the debatable margin. He thought the Association would not carry the present hospital staffs with them.—Dr. P. **Macdonald** supported any measure of postponement in view of his well-known conviction that voluntaryism could never supply an adequate hospital service.—Mr. W. **McAdam Eccles** opposed postponement for the reason that contributory schemes were springing up all over the country, and it was for the Association to guide public opinion.—Dr. H. B. **Brackenbury** pleaded for a definition now of staff funds so that returns might be obtained from the hospitals concerned.—Mr. **Souttar** said that every patient at the London Hospital was now assessed at what he could pay, up to £5 5*s*. a week. Was it the duty of the staff to treat all these paying patients gratuitously?—The President-elect, Mr. **Childe**, feared that the charitable public, on whom they still relied much, would withdraw their subscriptions when they heard of the staff fund. He thought it should not be beyond the constructive powers of the Association to arrange a scheme to provide medical treatment for the class between the poor hospital patient and the well-to-do while maintaining the voluntary principle intact.—Sir **Jenner Verrall** appealed to the mover not to split the profession on this issue.

In the event the amendment for postponement was carried by 84 votes to 70, and on Dr. Brackenbury's initiative the reasons for postponement were deleted from the amendment when passed as a substantive motion.

Definition of the Voluntary Hospital.

On a motion by Bolton to amend the definition of a voluntary hospital and asking the Association to maintain that "the essential feature of the voluntary hospital system consists in maintenance wholly or mainly by voluntary contributions and is not necessarily related to the conditions of service of the medical staff," the criterion of independent voluntary management was frankly described as the "charwoman definition." Dr. E. J. **Toye** (Barnstaple) insisted that a voluntary hospital is one in which the patient is treated gratuitously. He pictured the learned investigator of the future who unearthed the Bolton resolution being led to the conclusion that the ancient Britons had maintained temples which they called voluntary hospitals and that in these temples they kept gods which they tried to pacify by offerings known as voluntary contributions. The Bolton definition was rejected.

Contributory Schemes for Private Insured Persons.

On the invitation of the Brighton Division, which had sent up a closely reasoned memorandum dealing with contributory schemes for private insured persons, it was agreed without much discussion to refer to the consideration of the Council the following points for definite decision next year with such interim action as was within the present range of its hospital policy:—

(a) The income limit scale to be such as is approved by the majority of the medical profession resident and practising within the area of the scheme.

(b) Free choice of doctor (attendant and specialist) by patient subject to consent of doctor to act.

(c) The scheme to be administered by a general committee representative of the interests concerned, and not by a voluntary hospital or other coöperating institution.

(d) The method of remuneration of medical specialists to be payment for work done.

(e) Medical remuneration for specialist's services to be what the local profession considers adequate having due regard to the services to be rendered and other conditions of the scheme.

(f) Adequate medical representation of the General Committee administering the scheme with recognition of the Division (Branch) of the British Medical Association as representative of the profession in the area of the scheme.

(g) The accommodation provided for in-patient treatment to be at recognised nursing homes, paying hospitals, or in accommodation of the nature of a nursing home in connexion with a voluntary hospital.

—these proposals being based on the fundamental points adopted for domiciliary National Health Insurance.

The British Medical Journal.

The B.M.A. Council reported that this year Sir Dawson Williams completes 25 years' editorship of the *British Medical Journal*. It was resolved and carried by acclamation—

That this meeting sends its heartiest congratulations to Sir Dawson Williams, upon the completion of his 25 years as Editor of the *British Medical Journal*, and wishes him health and success in carrying on that work.

To signalise the occasion Sir Dawson Williams is to be the guest of the evening at the B.M.A. Council dinner on Oct. 24th.

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In asking for approval of the section of the annual report under the heading Science, the chairman of the Science Committee, Mr. H. S. **SOUTTAR**, spoke of the peculiar character of the Association's research scholarships, in that scholars were not required to devote the whole of their time to research, but might hold concurrently junior appointments at university or hospital. The Council was proposing to make additional grants for approved schemes of post-graduate education undertaken by the branches. He referred to the valuable work of Mr. W. G. Spencer as honorary librarian, and of Prof. R. T. Leiper in preparing the "Bibliographical Index." He hoped that the new home of the Association would prove a centre for exchange of scientific ideas. Mr. E. B. **TURNER** thought that now war conditions were passing more money should be given by the Association for "direct culture." He had been struck by the high qualification and claims of the candidates for scholarships.

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Election of Chairman and Deputy Chairman.

During the sitting the medical secretary announced that only one nomination each had been received for the chairmanship and deputy chairmanship of the Representative Body. Dr. R. WALLACE HENRY and Dr. H. B. BRACKENBURY were accordingly declared re-elected for the year 1923–24.

THE VOLUNTARY HOSPITALS DURING 1922.[1]

Sir Napier Burnett's fourth annual report on the voluntary hospitals in Great Britain (excluding the London area, where the hospitals are under the supervision of King Edward's Hospital Fund) was issued last week. The earlier publication of hospital reports this year has enabled the survey to be issued some three months in advance as compared with the report for 1921. Sir Arthur Stanley contributes a prefatory note, and two addresses by Sir Napier Burnett—the first dealing with contributory schemes as a feature of hospital finance, the second dealing with hospital treatment for middle-class patients, both delivered at the annual meeting of the British Hospitals Association at Sheffield in June of this year—are included as appendices. Chapters II. to VII. review the English voluntary hospitals, and Chapters VIII. to XII. relate to the Scottish hospitals.

Number of Patients Treated.

In Great Britain as a whole (excluding London) 643 voluntary hospitals supplied details of numbers of new patients treated during the year. These hospitals constitute 87 per cent. of the total number of hospitals, with 40,331 available beds (94 per cent. of the total possible); in all, 2,090,855 individual new patients were treated, at a total cost to the hospitals of £4,946,299. Towards this expenditure the hospitals received £4,868,615, leaving a deficit on the year's working of £77,684. The total number of new in-patients treated by the 643 hospitals was 501,945, and the total number of new out-patients 1,588,910. In England the 13 teaching hospitals were responsible for the treatment of 30 per cent. of the total number of patients treated in the 571 hospitals; in Scotland the six teaching hospitals were responsible for 51 per cent. of the total number of patients treated in the 72 hospitals.

Summary of Financial Situation.

During 1922 there was a great improvement in the finances of the hospitals. The excess of ordinary expenditure over ordinary income was £74,978, against £419,138 in 1921. These figures do not include any grants from the Voluntary Hospitals Commission, or free legacies, but refer solely to the ordinary trading or maintenance accounts for the year. Showing the two countries separately, for England and Wales the ordinary income failed to meet the ordinary expenditure in 1921 by £349,929; the corresponding deficit for 1922 was £28,085. In Scotland, in 1921 the deficit was £69,209, and in 1922 £46,893. The financial situation in the case of hospitals in Scotland is in reality much better even than these figures show, because, as is pointed out in the body of the report, the Scottish hospitals receive considerable sums in the form of free legacies year by year, with such regularity, that in a sense these legacies might be regarded as ordinary income. The above details dealing with the deficit refer to the 666 hospitals which forwarded their annual figures. Of the 666 hospitals, 378 (57 per cent.) had an excess of ordinary income over ordinary expenditure of £315,420, whereas 288 hospitals (43 per cent.) had an excess of expenditure over income of £390,398. The corresponding figures for 1921 were: Total number of hospitals reviewed, 656; of those, 335 (51 per cent.) had a surplus of £228,013, while 321 hospitals (49 per cent.) had a deficit of £647,151. These figures clearly show the progress made during the year. The surplus and deficit figures, as well as the number of hospitals, show a remarkable turnover. The progress made during the past three years is shown by the following percentage figures: In 1920, 44 per cent., in 1921, 51 per cent., and in 1922, 57 per cent. of hospitals had surplus of ordinary income over ordinary expenditure.

Notwithstanding the continuance of the financial depression throughout the country in 1922, deepening interest of the public in the voluntary hospital movement is shown by the following figures:—

	Ordinary income.		Decrease in ordinary expenditure.
England	£81,634 increase	....	£240,210
Scotland	£13,056 decrease	....	£35,372
Net increase	£68,578	....	£275,582

The remarkable reduction in ordinary expenditure, in which the majority of the hospitals participated, was in large measure accounted for by a fall of approximately 16 per cent. in the expenditure on provisions, 9 per cent. on surgery and dispensary, and 4 per cent. on domestic expenses. On the other hand, there was a slight increase of some 5 per cent. under the heading of salaries and wages.

Financial Heritage of Voluntary Hospitals.

A feature of the voluntary hospital system that is not always fully appreciated is the legacy towards the endowment of the hospitals that has come to the present generation from its predecessors. The 666 hospitals, with 41,043 available beds, dealt with in the present survey have invested funds to the total amount of £17,029,424, yielding an annual interest of £795,509, or £4·67 per cent. The hospitals in Scotland appear to receive a richer flow of legacies than the English hospitals.

Hospital Annual Reports and Vital Statistics.

A marked improvement in the form of presenting the hospital statistics is found in the annual reports for the past year, particularly in those of many smaller hospitals which have now adopted some modification of the uniform system of accounts, and publish an audited balance-sheet. Hospital statistics are of two kinds—(1) household or domestic statistics, and (2) vital statistics—relating to the patients treated; publication of the first group aids the improvement of hospital administration by comparison with other hospitals, and the second group is useful in that the advancement of clinical medicine and surgery is in no small measure dependent on case records. Hospitals could receive valuable guidance in the adoption of a uniform minimum standard of records to be kept, if such a standard were to be drawn up by some recognised authority, e.g., a joint committee set up by the Royal Colleges of Physicians and Surgeons.

Investigation of the Cause and Nature of Disease.

The daily hospital practice of voluntary doctors may be regarded as *defensive* medicine; in the work of the hospital laboratories medical science takes the *offensive*. It is still too little recognised by the public that the expanding science of preventive medicine owes its existence in large measure to work carried out in hospital laboratories. In large hospitals the laboratory accommodation has evolved during the past 25 years from a single room with one trained worker, until now there is a pathological and bacteriological institute attached to many of the hospitals and staffed by highly-trained personnel. In smaller hospitals, the gratifying information is to be found in many annual reports that during the past year steps have been taken to establish some form of laboratory accommodation; quite a number of hospitals for the first time publish details of laboratory work, and in some instances coöperative arrangements have been arrived at between a number of neighbouring smaller hospitals, so that the services of a pathologist may be available for the group. In other instances it has been suggested that applicants for the post of resident medical officers should produce evidence of special training and equipment in pathological and bacteriological work, sufficient to enable them to undertake a certain standard of laboratory work.

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[1] The Voluntary Hospitals in Great Britain (excluding London): Fourth Annual Report for the Year 1922. London: 19, Berkeley-street, W.1. *1s.*

Hospital Feeding.

The feeding of a patient is a very important factor in treatment, yet, speaking generally, it may be said that the subject has not hitherto received adequate attention. In a number of hospitals visited during the past two years, it was noted that the medical staffs were devoting considerable attention to this question of feeding, and had insisted on the establishment of a special kitchen committee to raise the standard of feeding in the hospital. The monotony of institution feeding cannot but react unfavourably upon the patient; more hospitals might adopt the idea of a kitchen committee, and it would be of great advantage were each large hospital to have a trained dietitian, who would work out for the doctor a diet suitable to the complaint of the individual patient. It is not, of course, suggested that this would be necessary for all patients. Increased attention, as above outlined, to the question of patient feeding, will probably raise the cost per bed, but any increase in the cost of provisions may be counterbalanced by a reduction on drugs. However, the public will never fail to respond to the call for additional money required in the improvement of the feeding of hospital patients.

The Cottage Hospital.

Chapter III. of the report contains some views set out at length on this subject. The question arises whether the cottage hospital idea has not been rather overdone. The steady falling-off in the number of occupied beds during the past three years lends colour to this idea; in England the percentage of available beds occupied was 69·48, and in 1922, 59·23; in Scotland the percentages were 77·16 in 1920 and 61·16 in 1922.

In the cottage hospitals in England and Scotland, on the average, approximately 2000 beds, out of a total of 5179, remained idle throughout 1922. Two suggestions are outlined whereby more use might be made of beds in rural hospitals—namely, (*a*) many of these cottage hospitals could negotiate with the large hospitals in neighbouring towns, to take in some patients in an early stage of their convalescence, and thus enable these overpressed town hospitals to overtake their waiting lists of patients; and (*b*) many cottage hospitals with empty beds could render excellent service to the local communities in which they are situate, by making arrangements to receive maternity cases, especially first cases, from the local villages around. Institutional provision for such work in rural areas is extremely limited; even the supply of trained maternity nurses in country districts is very inadequate. In agreeing to undertake this work, the cottage hospitals might render valuable assistance in reducing the present high rate of maternal mortality and morbidity.

Establishment of a Central Bureau of Information.

With the object of rendering further assistance to the voluntary hospitals, the Joint Council of the Order of St. John and the British Red Cross Society has established a central bureau of information on hospital matters, and a large number of hospitals have readily acknowledged their indebtedness for the assistance obtained from this source. The central bureau has also been utilised for hospital information during the past year by Government departments (War, India and Colonial Offices), by several of the Voluntary Hospital Committees set up by the Voluntary Hospitals Commission, and also by the Governments of several of the Overseas Dominions.

The report contains many useful charts and tables.

A YEAR'S WORK OF THE SCOTTISH BOARD OF HEALTH.[1]

THE annual report of the Scottish Board of Health now before us is a fairly complete summary of the various branches of public health and medical work carried out in Scotland at the expense of public funds; and it may be profitably read by candidates for a diploma in public health, by public health officials and administrators, and by social workers in general. Its contents are comprised under five headings: sanitation, medical and allied services, housing and town-planning, Poor-law and public assistance, and miscellaneous; and points calling for quotation or comment are contained in each of these sections. In a prefatory statement attention is drawn to the demand for economy and the distress among large sections of the population, which while pulling strongly in opposite directions has resulted in an unprecedented expenditure from public funds to relieve social distress. That the unfortunate character of the first of these pulls has been realised is shown by the statement that some of the health services on which the ban of economy has been especially exercised are practically new services "that were only in the course of development when the need for economy arrested them." Fortunately, prior to this fitful stage, sanitation had vastly improved.

Medical and Allied Services.

The statistics of pulmonary tuberculosis are interesting in contrast with those of England. They show a slight rise of death-rate in 1915, a practically stationary death-rate in the next three years, followed by decline; whereas in England war excess of death-rate from this disease is shown during four years. It seems likely that the unfavourable circumstances of war-time were less operative in Scotland than in England. As in England, there is some evidence of reduction of prevalence of venereal diseases; and the statistics as to numbers of patients receiving treatment at public clinics do not support the alarmist views of those who advocate compulsion in regard to continuance of treatment. Of the patients ceasing to be treated in the year, 45 per cent. were discharged cured, 7 per cent. were transferred to other treatment centres, and 21 per cent. left after completing a course of treatment, but before final tests as to cure had been made. It is noteworthy that of the cases of "syphilis alone" over 11 per cent. were congenital syphilis, illustrating once more the vast field only very partially explored of familial preventive medicine which might be cultivated, irrespective of any question of formal notification of disease. The statistics as to extra-genital syphilis place casually acquired syphilis of non-sexual origin in its proper place of relative unimportance, as only 0·86 per cent. of the cases treated were of this type.

We should have welcomed further particulars as to the Scottish experience of vaccination. There is much needed a comparative statement of Scottish and English experience concerning the supply of vaccine lymph; and it appears desirable that in both countries the State provision of guaranteed calf-lymph to medical practitioners applying for it should receive serious consideration, along with the imposition of the obligation on all practitioners receiving the lymph to make an exact report of the result of each vaccination. Attention is drawn to the excessive puerperal death-rate in Scotland which there is "ground for believing . . . is one of the highest to be found among civilised countries." The subject is under range of general practitioner service came in for criticism, especially in regard to the different abilities of the young and old, but Dr. Brackenbury pointed out that the schedule was not so much a definition of competence as of what an insured person under his contract was entitled to get from the insurance practitioner. An offer in this sense might be made, but it remained to be seen whether the Ministry of Health would accept it or not.

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[1] Fourth Annual Report of the Scottish Board of Health, 1922.

Election of Chairman and Deputy Chairman.

During the sitting the medical secretary announced that only one nomination each had been received for the chairmanship and deputy chairmanship of the Representative Body. Dr. R. WALLACE HENRY and Dr. H. B. BRACKENBURY were accordingly declared re-elected for the year 1923–24.

THE VOLUNTARY HOSPITALS DURING 1922.[1]

Sir Napier Burnett's fourth annual report on the voluntary hospitals in Great Britain (excluding the London area, where the hospitals are under the supervision of King Edward's Hospital Fund) was issued last week. The earlier publication of hospital reports this year has enabled the survey to be issued some three months in advance as compared with the report for 1921. Sir Arthur Stanley contributes a prefatory note, and two addresses by Sir Napier Burnett—the first dealing with contributory schemes as a feature of hospital finance, the second dealing with hospital treatment for middle-class patients, both delivered at the annual meeting of the British Hospitals Association at Sheffield in June of this year—are included as appendices. Chapters II. to VII. review the English voluntary hospitals, and Chapters VIII. to XII. relate to the Scottish hospitals.

Number of Patients Treated.

In Great Britain as a whole (excluding London) 643 voluntary hospitals supplied details of numbers of new patients treated during the year. These hospitals constitute 87 per cent. of the total number of hospitals, with 40,331 available beds (94 per cent. of the total possible); in all, 2,090,855 individual new patients were treated, at a total cost to the hospitals of £4,946,299. Towards this expenditure the hospitals received £4,868,615, leaving a deficit on the year's working of £77,684. The total number of new in-patients treated by the 643 hospitals was 501,945, and the total number of new out-patients 1,588,910. In England the 13 teaching hospitals were responsible for the treatment of 30 per cent. of the total number of patients treated in the 571 hospitals; in Scotland the six teaching hospitals were responsible for 51 per cent. of the total number of patients treated in the 72 hospitals.

Summary of Financial Situation.

During 1922 there was a great improvement in the finances of the hospitals. The excess of ordinary expenditure over ordinary income was £74,978, against £419,138 in 1921. These figures do not include any grants from the Voluntary Hospitals Commission, or free legacies, but refer solely to the ordinary trading or maintenance accounts for the year. Showing the two countries separately, for England and Wales the ordinary income failed to meet the ordinary expenditure in 1921 by £349,929; the corresponding deficit for 1922 was £28,085. In Scotland, in 1921 the deficit was £69,209, and in 1922 £46,893. The financial situation in the case of hospitals in Scotland is in reality much better even than these figures show, because, as is pointed out in the body of the report, the Scottish hospitals receive considerable sums in the form of free legacies year by year, with such regularity, that in a sense these legacies might be regarded as ordinary income. The above details dealing with the deficit refer to the 666 hospitals which forwarded their annual figures. Of the 666 hospitals, 378 (57 per cent.) had an excess of ordinary income over ordinary expenditure of £315,420, whereas 288 hospitals (43 per cent.) had an excess of expenditure over income of £390,398. The corresponding figures for 1921 were: Total number of hospitals reviewed, 656; of those, 335 (51 per cent.) had a surplus of £228,013, while 321 hospitals (49 per cent.) had a deficit of £647,151. These figures clearly show the progress made during the year. The surplus and deficit figures, as well as the number of hospitals, show a remarkable turnover. The progress made during the past three years is shown by the following percentage figures: In 1920, 44 per cent., in 1921, 51 per cent., and in 1922, 57 per cent. of hospitals had surplus of ordinary income over ordinary expenditure.

Notwithstanding the continuance of the financial depression throughout the country in 1922, deepening interest of the public in the voluntary hospital movement is shown by the following figures:—

	Ordinary income.	Decrease in ordinary expenditure.
England	£81,634 increase	£240,210
Scotland	£13,056 decrease	£35,372
Net increase	£68,578	£275,582

The remarkable reduction in ordinary expenditure, in which the majority of the hospitals participated, was in large measure accounted for by a fall of approximately 16 per cent. in the expenditure on provisions, 9 per cent. on surgery and dispensary, and 4 per cent. on domestic expenses. On the other hand, there was a slight increase of some 5 per cent. under the heading of salaries and wages.

Financial Heritage of Voluntary Hospitals.

A feature of the voluntary hospital system that is not always fully appreciated is the legacy towards the endowment of the hospitals that has come to the present generation from its predecessors. The 666 hospitals, with 41,043 available beds, dealt with in the present survey have invested funds to the total amount of £17,029,424, yielding an annual interest of £795,509, or £4·67 per cent. The hospitals in Scotland appear to receive a richer flow of legacies than the English hospitals.

Hospital Annual Reports and Vital Statistics.

A marked improvement in the form of presenting the hospital statistics is found in the annual reports for the past year, particularly in those of many smaller hospitals which have now adopted some modification of the uniform system of accounts, and publish an audited balance-sheet. Hospital statistics are of two kinds—(1) household or domestic statistics, and (2) vital statistics—relating to the patients treated; publication of the first group aids the improvement of hospital administration by comparison with other hospitals, and the second group is useful in that the advancement of clinical medicine and surgery is in no small measure dependent on case records. Hospitals could receive valuable guidance in the adoption of a uniform minimum standard of records to be kept, if such a standard were to be drawn up by some recognised authority, e.g., a joint committee set up by the Royal Colleges of Physicians and Surgeons.

Investigation of the Cause and Nature of Disease.

The daily hospital practice of voluntary doctors may be regarded as *defensive* medicine; in the work of the hospital laboratories medical science takes the *offensive.* It is still too little recognised by the public that the expanding science of preventive medicine owes its existence in large measure to work carried out in hospital laboratories. In large hospitals the laboratory accommodation has evolved during the past 25 years from a single room with one trained worker, until now there is a pathological and bacteriological institute attached to many of the hospitals and staffed it was 0·93, and in 1921 it was 0·97 per 1000 of the total population, and allowing for variation in the numbers employed in the trade and for the diminution in the death-rate from pulmonary tuberculosis, it must be conceded that in the years 1920 and 1921 the death-rate from this disease was much higher for brass workers than it was for the total population. If the injurious effects from this trade are to be reduced to a minimum adequate methods for ventilation must be utilised, and provision for the ready escape of fumes and dust must be forthcoming. In those processes where dust is produced, arrangements should be made for its removal and the prevention of its dissemination in the atmosphere. The figures relating to alcoholism and mortality amongst brass founders suggest the necessity for more temperate habits amongst this class of worker. The importance of satisfactory housing accommodation for those who work under conditions such as many brass workers experience is too obvious for comment.

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[1] The Voluntary Hospitals in Great Britain (excluding London): Fourth Annual Report for the Year 1922. London: 19, Berkeley-street, W. 1. 1s.

Mr. G. A. ISAACS (general secretary, National Society of Operative Printers and Assistants) then read a paper dealing with the printing trade. He stated that it is now generally accepted that the prevalence of tuberculosis is relatively higher in the printing trades than in any other. Some authorities, he said, believed that the presence of lead in this industry was an important factor in the causation of tuberculosis. The Austrian Government's report on health conditions in the printing trades, published in 1909, refers to the fact that lead poisoning and tuberculosis go hand in hand. He blamed the former low standard of living for the prevalence of the disease among machine-room workers. An improved standard of life had brought about improved conditions. Hygienic conditions in machine-rooms had received attention, but they still await the introduction of a vacuum cleaner, as now so universal in American offices. He stated that, given more information and expert guidance, the printing industry would do its share towards improving conditions.

Dr. J. DOIG MCCRINDLE (medical officer of health and chief tuberculosis officer, Corporation of Northampton) spoke of a considerable incidence of the disease among boot operatives. He complained that sanatorium patients were not allowed to resume the work they knew, but were taught uninteresting and unremunerative outdoor employments which brought in a wage that was beggarly in the delicate condition of the patient. He suggested the setting up of workshops under skilled supervision, where the lighter, if not all, processes of bootmaking could be carried out by the patients.

Dr. H. SCURFIELD (late medical officer of health for Sheffield) dealt with tuberculosis in connexion with grinders. He stated that 50 per cent. of the grinders in Sheffield died of pulmonary tuberculosis. When the rate is split up, it is found that it is only the male death-rate from pulmonary tuberculosis which is high compared with the English rate. The female death-rate from pulmonary tuberculosis is much below the English standard. A comparison of the rates in the large towns show an extraordinary variation. He stated that he had for long thought the industrial factor very important, and he did not think it would have been possible for publicists to give but the quarter-truth. "Tuberculosis is a housing problem" if it had been generally recognised that the sex most in the house had a tuberculosis mortality only about two-thirds of that of the other sex. He made the suggestion that this Association confer with the Society of Medical Officers of Health, with a view to considering exactly what statistics would serve the purpose, so that in due course a proposition may be submitted to the Ministry of Health.

Dr. R. PRATT (Leicester), Mr. T. W. MCARA (secretary of the Newspapers Proprietors Association), Dr. REGINALD DUDFIELD (medical officer of health for Paddington), the MAYOR of West Ham, Dr. TRIMBLE (Belfast), and Dr. J. WHEATLEY (medical officer of health for Shropshire) also took part in the discussion.

AFTERNOON SESSION, JULY 13TH.

Sir ROBERT PHILIP (President of the Royal College of Physicians of Edinburgh) took the chair.

Dr. G. LISSANT COX (central tuberculosis officer, Lancashire County Council) opened the discussion on

Notification of Tuberculosis: Proposed Amendments of Procedure.

He stated that the compulsory notification of all cases of tuberculosis has now been in force for ten years, and may be regarded as the foundation on which public health measures are based. The object of the notification of persons suffering from tuberculosis, required to be made under the Public Health (Tuberculosis) Regulations of 1912 and 1921, is to make the medical officer of health aware of the existence of a case of infectious disease in his district so that appropriate measures can be taken in regard to the prevention of the spread of infection. Considerable attention has been drawn to the unknown infective cases of tuberculosis existing amongst the community, and the number of deaths from pulmonary tuberculosis which are reported for the first and only time at death, give some indication of the importance of this aspect of the disease. Special investigations carried out in Lancashire since October, 1920, give the following important results:—

(*a*) That so many as 43 of the 194 deaths in 1922 occurred in public institutions; (*b*) that in 25 per cent. of the remaining 147 the doctor was only called in attendance a matter of a few days prior to death; (*c*) that in only 7 per cent. of the 147 deaths there was apparently no reasonable excuse for non-notification; (*d*) that while it is possible to suggest that a large proportion of persons certified as dying from tuberculosis (all forms) but not previously notified as suffering from the disease, were wrongly *diagnosed by the practitioner* at the time of writing out the death certificate, there does not appear *from our inquiries* to be any large margin of error so far as pulmonary tuberculosis is concerned, and consequently the importance of the non-notification of these cases can be seriously discounted; (*e*) that in 47 per cent. of the 147 deaths notification was not made owing to a misunderstanding of the Tuberculosis Regulations, or to the belief that the case had already been notified.

From the above, Dr. Cox continues, it is clear that Article V. of the Public Health (Tuberculosis) Regulations, 1912, should be simplified by amending or repealing the qualification that a doctor shall not notify a case if he has reasonable grounds for believing that the case has already been notified.

Dr. DUDFIELD stated that nothing was to be gained by refusing to recognise the fact—that compulsory notification of tuberculosis had not achieved the success hoped for. Not only is notification incomplete, but too many certificates are received too late. Dr. Dudfield also proposed an amendment in Article V. of the Public Health (Tuberculosis) Regulations, 1912, viz., "if he has reasonable grounds for believing a case has already been notified . . . ." leads to omission when two or more practitioners treat a case, each looking to the other to notify. Again, when a patient whose case has been notified in one district moves to another, but remains under the care of the same practitioner, he thinks that further notification is not required. The latter reading of the proviso he considers wrong, as the proviso ends with the words (following immediately after those already quoted) "to the medical officer of health for the district within which the place of residence of the person is situate." He is of the opinion that the proviso ought to be repealed, thereby making every practitioner "attending or called in to visit" a case of tuberculosis responsible for the notification of the case and eliminating the leak which at present exists under the Article.

Dr. CECIL WALL (physician to London Hospital and Hospital for Consumptives, Brompton) suggested that suspects of tuberculosis should be notified, and the printed form be amended so that by a stroke of the pen the doctor may state whether he suspects, or is certain of, the diagnosis.

Prof. J. ROBERTSON (medical officer of health for Birmingham) said that what he was going to say consideration, and there can be little doubt that a large share of this mortality is preventable. A useful summary is given of the work of the Highland and Islands (Medical Service) Fund, provided by the Government, to supply medical services in areas in which otherwise this would be lacking. The mere physical difficulties in certain instances, even with a provided service, are almost appalling, as in a striking instance recorded in the report, in which a single visit entailed an absence of the doctor from his home during four days.

Milk-supply, Medical Benefit, Housing.

Attention is drawn to the valuable report issued by the Scottish Inter-departmental Committee on the laws, regulations, and procedure governing the sale of milk in Scotland. In this report the setting up of a legal minimum limit of fat content is recommended, a procedure which would cut the Gordian knot of serious administrative difficulty in the control of milk-supply. On the working of the National (Health) Insurance Act the report is optimistic, and the opinion is expressed that the work of administering the Act was carried out by societies and branches in an efficient and satisfactory manner, though note is made of the multiplicity of Acts and Regulations which have rendered this task unnecessarily difficult. No marked dissatisfaction with the working of medical benefit has been shown, and attention is drawn to the success of the district medical staff. The trend of movement of membership from friendly societies in the direction of the industrial and collecting societies is also noted—a movement of doubtful gain, if any.

The housing position continues unsatisfactory in Scotland as in England. Credit is given to the Government "cuts" in July, 1921, for the healthier condition in building costs; and the Scottish Board continue to take the larger view and insist on a reduction in costs. Nevertheless, the housing problem in Scotland is still a long way from being solved, and the shortage is stated in the report to be probably accumulating.

The section of the report dealing with Poor-law relief is necessarily its least satisfactory part. Not only is there no evidence of attempt to increase the preventive element in Poor-law administration, but no indication is visible of increasing effort to make Poor-law infirmaries more generally available and to separate them more completely from workhouses. These problems call for early attention, for which legislative as well as administrative reforms are required; but in present circumstances these important social measures will be difficult to secure. It may be hoped that the recent report of the Scottish Committee on this subject will lead to practical action.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

(Concluded from p. 124.)

FRIDAY, JULY 13TH.

Sir ARTHUR STANLEY presided over the meeting. The subject for the morning session was

Relative Prevalence of Tuberculosis among Workers in Different Trades: Methods which are Likely to Reduce the Incidence in Special Trades.

Prof. VICTOR WOROBIOF (of the University of Moscow) conveyed the greetings of the All Russian Tuberculosis Conference to this conference.

The discussion was opened by Prof. E. L. COLLIS (Mansel Talbot Professor of Preventive Medicine, University of Wales). Industry, he stated, has been accused of being in Great Britain the last stronghold of phthisis. There lies in this accusation a large element of truth, so far as adult tuberculosis is concerned. Nevertheless, the manifold influence exerted by modern industrialism upon the general health of the community, of which the prevalence of phthisis is a useful index, must be grasped before more direct influences exerted by certain occupations can be seen in true perspective. Generally speaking, the course of events appears to have been that, whenever the habits and customs of a community in which tuberculosis is endemic have been disturbed, the disease has increased in prevalence. The sociological changes covered by the words "disturbance of habits and customs" must be held to include food-supply in relation to the call for energy output, aggregation of population in great centres of industry, with regard to both housing conditions and places of employment, transport facilities, increase in the alcoholic habit, &c. Associated with this increased prevalence the age of maximum incidence of the disease is found to move from late life to early adult life. Then as the community settles down to the new conditions phthisis falls and the age of the maximum incidence recedes again to late life. Undoubtedly changes in habits and customs associated with the advance of modern industrialism have exerted a powerful influence upon the prevalence of phthisis. Three influences were at work conducing to phthisis. The first was the aggregation of individuals employed at sedentary work; the second the alcoholic habit; and the third exposure to certain dusts containing silica. On the other hand, hard work, mental or physical, outdoor life, and uncrowded indoor life in no way favoured the disease. Industrial prosperity resulting in better feeding, the avoidance of overcrowding, sobriety, and the suppression of dust were also potent preventives of phthisis mortality. Phthisis mortality in America had fallen in a remarkable way since prohibition.

Dr. G. B. DIXON (chief tuberculosis officer for Birmingham) dealt with pulmonary tuberculosis amongst brass workers. An examination, he said, of the mortality returns, which refer to males engaged in different occupations in England and Wales during the years 1910–12, showed that workers in the brass and bronze trade present a higher mortality rate of pulmonary tuberculosis than occurs amongst male workers in many other occupations. It is a mortality rate which approximates to that of occupations which have a recognised and ill-reputation, because of the excessive prevalence of tuberculosis amongst those employed in them. Workers in the dipping shops are exposed to the inhalation of acid fumes and to the weather, and they frequently stand on wet floors. Polishers work in an atmosphere containing an amount of dust, which varies according to the ventilation and cleanliness of the place in which they are employed. The dust is partly metallic and partly composed of a mixture of sand, and lime and textile fluff worn off the polishing discs. As a result many of them suffer from chronic bronchitis, pulmonary tuberculosis, and fibroid changes in the lungs. Simon and Kynvett call attention to the fact that amongst 1200 brass casters in Birmingham, there were not more than ten who were over 60 years of age, and in connexion with the superannuation fund of the Brass Workers' Association, from which casters at the age of 55 can derive benefit, only three men were enjoying this benefit.

The Registrar's death returns for Birmingham show that during 1921 there were 502 deaths from pulmonary tuberculosis amongst males of 15 years and upwards, and of this number 46, or 9·2 per cent., occurred amongst brass workers. Similarly, in the year 1922, there were 528 deaths from the same disease, of which 51, or 9·6 per cent., occurred amongst brass workers. These numbers were the largest for pulmonary tuberculosis associated with any occupation, during the period, notwithstanding the fact that brass work, although an important section of the city's industry, was not the one giving employment to the largest number of persons. The census return for the city in 1911 showed that there were 9879 males, exclusive of 1484 brass founders and 747 brass finishers employed in the trade. Undoubtedly, since that date the numbers had undergone some change, but so also has the mortality rate for pulmonary tuberculosis. In 1911 it was 1·14 per 1000, in 1920

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal ealth statistics of a group of cities, towns, and urban istricts for 1922 :—

Name of town.	Estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Carlisle C. ..	53,490	23·6	14·6	1·2	1·2	3·6	77	147	2·4
Worcester C. ..	49,240	19·8	13·5	1·2	1·2	3·2	64	143	2·0
Winchester C. ..	23,750	19·2	11·5	0·5	1·4	1·9	37	48	4·4
Northampton C.B.	92,950	17·7	11·3	1·1	1·2	2·4	51	80	1·8
Torquay B. ..	33,690	14·5	17·5	1·8	1·8	3·2	38	121	6·1
Heston and Isleworth U.D. ..	46,330	18·7	11·8	1·0	1·0	2·1	70	226	4·4
Hendon U.D. ..	55,930	17·4	8·8	0·6	1·2	1·7	42	98	2·0
Ilford U.D. ..	86,370	17·8	9·5	0·6	1·0	1·7	52	135	4·0
Spenborough U.D.	31,670	16·3	12·6	0·8	1·3	2·6	90	266	12·0
Swinton and Pendlebury U.D.	31,780	19·0	11·0	0·8	1·1	3·2	74	143	5·0
Tottenham U.D.	150,500	21·0	11·3	1·0	1·1	2·6	—	—	1·6
Willesden U.D. .	168,900	18·7	10·6	0·9	1·0	2·3	54	245	3·2

C.=City. C.B.=County borough. B.=Borough.
U.D.=Urban district.

Carlisle.

Dr. Joseph Beard reports that Carlisle, like many other towns, suffered from an influenza epidemic during the first quarter and that 55 deaths of residents were registered from this cause. The maternity hospital admitted 183 cases as against 144 in 1921. The number of women resorting to artificial feeding during the time of the midwife's attendance is less, but Dr. Beard thinks artificial feeding is much too frequent, considering the small number of married women industrially employed. One-third of the 180 new expectant mothers attending the ante-natal clinic had definite abnormalities needing attention. The number of stillbirths notified was 66, equal to 5 per cent. of the live births. There were 6 infantile deaths due to accident, and in 4 of these accidental smothering was the cause given. Definite action is being taken to compel owners to carry out war arrears of repairs.

Worcester.

Dr. Mabyn Read reports that housing shortage is still urgent. The overcrowding is often bad, but to take action would have been in most cases a cruel act. Dr. Read is afraid that in the years to come there will be an increase of tuberculosis, owing to lessened resistance, caused by overcrowding, want of sunlight in the homes, insufficient food, and anxiety due to unemployment. The "appeal to the cow" was utilised in most of the successful milk prosecutions. Dr. Read regrets the reluctance of women to seek treatment at the V.D. clinic for gonorrhœa. The need for a maternity home is felt. Half the infant deaths occur in the first month, showing the need for ante-natal work. From 13 to 14 expectant mothers in the last three months of pregnancy and nursing mothers were provided with dinners daily at a cost of 1*s*. 3*d*. and subsequently 1*s*. per dinner, with good effect. Dr. Marion Andrews comments favourably on the fact that midwives sent for a doctor in about 20 per cent. of their cases.

Winchester.

Dr. W. A. Bruce Young reports that the rapid completion of a large number of houses at Stanmore is having an appreciable effect on overcrowding, which is, however, still considerable. The large amount of unemployment has called for a corresponding supply of extra milk for mothers and babies and will probably call for still more next winter. The outstanding needs of the schools are: (1) A school dental service; (2) medical inspection for secondary schools; (3) play-ground classes or an open-air school; (4) a special school for backward children and higher-grade mental defectives.

Northampton.

Dr. J. Doig McCrindle pays a tribute to the foresight of the water engineer in saving the town from a water shortage; a temporary supply from the river was chlorinated and rendered safe. The use of this supply was discontinued in August, 1922. Although the corporation have been active in providing new houses, 224 municipal houses having been completed during 1922, the result was not much in evidence in the relief of overcrowding. Action with regard to an unhealthy area, comprising 67 houses with a population of 314, reported by Dr. McCrindle, has been postponed. Most of the milk prosecutions were dismissed, and Dr. McCrindle thinks that the "Hunt *v.* Richardson" case and the "absurd" circular letter of the Ministry of Health of July 17th, 1922, have rendered futile attempts to deal with milk found not to be genuine. Elementary, private, and Sunday schools were closed for a time at the end of January owing to the influenza epidemic. The ante-natal work has progressed, and Dr. McCrindle can point to a decline in neo-natal mortality as compared with the previous decade.

Torquay.

Dr. Thomas Dunlop points out with reference to the high death-rate from cancer that the population includes a large number of old people. The general death-rate of 17·5 becomes 15·3 when corrected for age and sex. There is no maternity home and ante-natal work is hardly begun. Dr. Dunlop regrets that the proposal to have a V.D. centre fell through on financial grounds. The building of bungalows in areas which cannot be sewered owing to the levels is commented on. A local Bill now before Parliament includes provisions likely to prove useful—e.g., powers to establish a public abattoir, to prevent an advanced consumptive from handling food, to require persons dealing in shell-fish to furnish the source of supply, &c. A committee has been formed to create a demand for Grade A milk, and deputations have been to Reading to study methods. Owing to housing shortage, an insanitary area cannot be dealt with, and it is difficult to get repairs carried out.

Heston and Isleworth.

Dr. Elwin H. T. Nash reports that there are 41 private wells in his district, from which water is used for domestic purposes. During the year 117 taps from the main, in lieu of taps from inaccessible and uncovered cisterns, were provided in compliance with notices. An interesting account is given of the outbreak of lead poisoning associated with beer containers lined with a lead-containing enamel. Dr. Nash and all those concerned, including the brewery company, are to be congratulated on the prompt manner in which the matter was dealt with and the containers removed. During the autumn the hospital was overtaxed and the Milne treatment was adopted with success for home-treated cases of scarlet fever. A midwife was reported for delay in complying with the regulations in a case of ophthalmia neonatorum. The child in question is completely blind and Dr. Nash is amazed that the Central Midwives Board have merely placed the midwife on three and six months' probationary service. Ante-natal work is negligible and baby-welfare work difficult owing to unsuitability of premises, and there is no dental clinic for mothers and little children. Housing conditions remain unsatisfactory and overcrowding cannot be dealt with. Dr.

about notification had already been said by the men before him, but there were one or two points he would like to emphasise. His own experience was that if proper facilities were given to medical practitioners to enable them to make a diagnosis in difficult cases, there was not much difficulty in notification being properly carried out. He also mentioned the importance of medical students getting more responsible training in the difficult diagnosis of the early case of phthisis; up to the present time adequate training was not sufficient. He advised more observation beds in sanatoriums and the facilities of X ray, &c.

The conference concluded with votes of thanks to the City Authorities, to the Health Committee, and Prof. John Robertson for the excellent arrangements made. A lecture was given in the evening in the large lecture hall of the Birmingham Midland Institute by Sir ROBERT PHILIP, his subject being: The Actual Position of the Tuberculosis Problem To-day. Prof. John Robertson presided. On July 14th various visits to institutions and places of interest were arranged.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Medical Centre for the Service de la Navigation Aérienne.

THE medical centre for examination and study attached to the Service de la Navigation Aérienne was recently opened at the air-port of Bourget, near Paris, in the presence of Mr. L. Eynac, Under-Secretary for Aeronautics. The Service is civilian, and independent of the medical department of the Military Air Service. Its director is Dr. Paul Garsaux, who is known for his work on the influence of high altitudes on the human organism. Dr. Garsaux gave an outline of the objects of the Service, which is installed in an up-to-date pavilion named after Paul Bert, whose memory is associated with work on atmospheric pressures. The ground floor of the building contains administrative offices, an aid-post, two operating theatres prepared for emergency action, a dispensary, a bacteriological laboratory, a physiological laboratory, and several rooms for examination of pilots. The tests in use will be those laid down according to Annexe E of the Peace Treaty, which deals with the regulation of air navigation. The chief interest of the establishment, however, is the basement, which contains an air-tight compartment, measuring 5 by 3 metres. By means of a turbine engine the air of this compartment can be depleted in order to reproduce the atmospheric condition at any given altitude, and a refrigerating plant is attached which reduces the temperature in proportion to the atmospheric pressure obtained. The whole apparatus is electrically worked, with a system of illuminated safety signals. This unique establishment should enable much useful research work to be carried out.

International Congress for Social Hygiene Propaganda.

An International Congress dealing with social hygiene propaganda and with prophylactic, sanitary, and moral education, was held in Paris at the end of May. The congress was divided into five sections, among the presidents of sections being Profs. Léon Bernard, E. Jeanselme, and Pinard. The general subjects were as follows: (1) The rôle of public institutions for social hygiene; (2) the possibility of the establishment of a schedule of venereal diseases; (3) prophylaxis against venereal diseases in marriage and in the family; (4) sexual education at puberty and in general; (5) Red Cross work. Conspicuous among the communications made to the first section was one by Dr. M. Laignel-Lavastine on prophylactic education against poisons, alimentary (coffee, alcohol, &c.) and non-alimentary (opium, cocaine, &c.). Resolutions were passed by the fourth section to the effect that instruction with regard to the sexual instinct, and the high duties and dangers connected with it, should be given in all primary schools, and to all children of both sexes, according to their ages; that until the onset of puberty instruction should be confined to facts relating to lower animals and to vegetable life; that moral instruction should include consideration of chastity and continence, and of the duty of adults to have children under the best possible social conditions; and that girls should be taught the significance of the secondary sexual characteristics at the time of the appearance of the latter.

Deaths of Drs. O. Josué and J. P. Langlois.

Dr. O Josué, physician to the Hôpital de la Pitié, and vice-president of the Société de Biologie, died suddenly whilst at work in the hospital. He published several works dealing with adrenalinæmia, in which he described the action of adrenalin in the formation of atheromatous lesions, and in the production of aneurysms, and later specialised in the study of cardiac affections.

Dr. J. P. Langlois, professeur agrégé of the Faculté de Médecine de Paris, was professor of hygiene at the Conservatoire des Arts et Métiers, a member of the Académie de Médecine, and one of the leading physiologists of the day. Born in 1862, he became a pupil of Charles Richet, and under his direction, in a thesis for the degree of doctor of medicine, described new research work with the colorimeter, with particular reference to caloric radiation at various times of day. He emphasised the importance of, and in 1887 undertook the study of, the rôles of acute and chronic diseases in the production of heat. In recent years American research work in relation to basal metabolism has confirmed his results, first published in 1896. After study relating to the suprarenal capsules, Langlois carried out research into chlorine equilibrium, holding that the blood maintained this equilibrium even after a hæmorrhage, or after a prolonged chlorine-deficient diet drawing on the chlorine supply of other tissues, notably the muscles. At the same time he worked at the application of physiology to industrial hygiene, particularly in relation to work in warm and humid conditions, and to the physiological effects of nitrous vapour. His long record of valuable service led to his election to the newly constituted chair of physiology applied to physical education.

The Services.

ROYAL NAVAL MEDICAL SERVICE: NEW DIRECTOR-GENERAL.

Surg. Rear-Admiral Joseph Chambers, C.B., C.M.G., has been appointed Director-General of the Medical Department of the Navy in succession to Surg. Vice-Admiral Sir Robert Hill, K.C.B., K.C.M.G., C.V.O., K.H.S., with effect from Oct. 1st next.

ROYAL ARMY MEDICAL CORPS.

Capt. A. F. C. Martyn is restd. to the estabt.

Temp. Capt. W. M. M. Jackson relinquishes the temp. rank of Maj.

Temp. Capt. W. M. M. Jackson relinquishes his commn. and is granted the rank of Maj.

The undermentioned temp. Capts. relinquish their commns., and retain the rank of Capt.: G. B. Proctor and A. R. Leach.

TERRITORIAL ARMY.

Capt. Q. V. B. Wallace, R.A.M.C., to be Divl. Adjt., 42nd (E. Lancs.) Div. and School of Instruction, vice Maj. W. H. O'Riordan, R.A.M.C., vacated.

Capts. J. M. Smellie (late R.A.M.C., Spec. Res.), A. C. Haddow (late R.A.M.C., T.F.), and R. Cunningham (late R.A.M.C., Mila) to be Capts.

Capt. H. Jacques relinquishes his commn. and retains the rank of Capt.

W. Simpson to be Lt.

Second Lt. W. H. A. Dodd (late R.A.F.) to be Lt.

TERRITORIAL ARMY RESERVE.

Cols. de B. Birch, J. Turton, E. Lee, H. J. Mackay, and J. R. I. Raywood having attained the age limit are retired and retain their rank with permission to wear the prescribed uniform.

Cols. C. E. Harrison and E. C. Freeman having attained the age limit are retired and retain their rank.

book on Therapeutic Immunisation in Asylum and General Practice, a work which advanced views in many directions controversial, but which at the same time gave much food for thought. He was ever distressed at the difficulty of preventing mental disease in our present state of knowledge, and his book is a valiant attempt to solve this problem. It covers ground which has still to be tested, and, indeed, Dr. Robertson admitted that "numerous facts new to science are recorded and many heterodox opinions are expressed which are not likely to be accepted without a fight." It was Dr. Ford Robertson who translated Tanzi's "Text-book of Mental Diseases," one of the best presentations of the science of psychiatry of its date (1909). He will be remembered as one of those who strove constantly to correlate mental and physical disease and who succeeded at any rate in stimulating others to further research on these lines.

Correspondence.

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In June, 1921, I was apparently successful in eradicating this parasite from a coloured boy of 13, who had acquired the infection through swimming in the brickfields outside Durban in 1920. The usual signs of degeneration were observed in both lateral and terminal-spined ova obtained from the urine during a course of intramuscular injections of *emetine*.

This would appear to be the first case where *S. mansoni* has been recorded in a patient who has never left South Africa, and the infection was a slight one, giving rise to no symptoms other than those generally associated with early infestation with *S. hæmatobium* although the lateral-spined ovum was obtained both from the urine and a rectal wash.

Although well known at Kingwilliamstown in the Cape, it was thought that bilharzia disease did not occur in Natal rivers south of Durban, and that the Amanzimtoti river, which is, perhaps, the most popular place for Durban picnic parties, was certainly free from infection. However, I have collected examples of *Physopsis africana*, *Limnæa natalensis*, *and Isidora forskali* from this river, and have treated patients who have become infected with *S. hæmatobium* through bathing in several rivers along the south coast of Natal.

On June 15th, 1923, I commenced to treat a native, aged 15, who had suffered from constant hæmaturia since bathing in the Umtalumi river near Umzinto. During the last two years he has lived at a mission station near the source of the Amanzimtoti river. I have already drawn attention to the undesirability of allowing bilharzia carriers to attend schools along the course of rivers infested with the intermediary hosts of the bilharzias. Microscopic examination of the centrifugalised urine of this native showed numerous spine-pointed ova and a few lateral-spined ones. These rapidly disappeared, after showing the usual degenerative changes, under intravenous injections of *tartar emetic*, the potassium salt being used throughout. No ova were seen in a rectal wash on June 26th; but, by that time, the ova had almost entirely disappeared from the urine. In this healthy-looking native the only symptom noted was the chronic hæmaturia, which was apparently due to the escape of the numerous spine-pointed ova.

Both *S. hæmatobium* and *S. mansoni* infestation can be acquired at the Natal coast. It is impossible to say whether the latter has been introduced into the Union as a result of untreated cases returning from Egypt; but, as the introduction of a new disease is often associated with severe symptoms, these slight manifestations of *S. mansoni* infestation in young persons suggests that they are sporadic cases alone.

Nevertheless, the presence of intermediary hosts of this parasite in all the Natal rivers indicates the importance of diagnosing and treating this condition before it is allowed to spread further in the Union.

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LANCASHIRE INSURANCE COMMITTEE AND THE SPAHLINGER TREATMENT.—On July 18th a deputation from the Lancashire Insurance Committee went to the Health Ministry to ask permission to make a grant of £100,000 towards financing M. Spahlinger's Institute at Geneva, so that the Spahlinger serum may be available for insured persons in the county. On a previous occasion a similar proposition to the Ministry led to no definite result. The deputation proposed to make use of the power given to insurance committees under Section 21 of the Act of 1911, to spend such funds through some approved charitable institution. The intention is to set up such an institution at Eastbourne, to which the Spahlinger products would be sent from Geneva for the treatment of patients from Lancashire. Dr. Thomas Watts, M.P., who accompanied the deputation, called attention to the high percentage of cases treated with these remedies which had derived permanent benefit. The deputation was asked to provide further proof that the proposed Eastbourne institution will be a "charitable institution" in a legal sense, and the furnishing of such evidence is now under consideration.

Nash is strongly opposed to wholesale removal of enlarged tonsils, as he finds that a considerable number disappear after a septic mouth has been cleaned up. He also advocates complete enucleation and does not believe in the removal of a mere slice. There is need for an open-air school.

Hendon.

Dr. T. S. McIntosh points out one disadvantage of the substitution of gas-fires for coal—viz., the increase in house refuse. The Hendon Council have decided to build a new hospital in lieu of the temporary one which has been in use for 30 years. Dr. McIntosh reports that there is some difficulty in getting defects of the teeth and vision treated in the schools.

Ilford.

Dr. A. H. G. Burton submits a very complete report on the health administration and school medical service of Ilford. The percentage of children found by the school nurses with verminous heads has been reduced from 10 per cent. in 1920 to 5 per cent. in 1922. The work of Mr. R. S. Charsley, the school oculist, is being more appreciated, and he succeeded in treating 90 per cent. of the discovered cases of defective vision. The school dentist is faced by a formidable task, as 62 per cent. of the children examined by him needed treatment, and, although less than half of these were brought by the parents for treatment, the number actually treated exceeded 2000. Satisfactory arrangements have now been made with neighbouring districts for the accommodation of small-pox patients at the Orsett Joint Hospital in the first instance, with the West Ham Council's hospital at Dagenham in reserve.

Spenborough.

The chief event recorded by Dr. Lawrence Pick is the opening of the new health offices with a school clinic and maternity and child welfare centre. Dr. Pick, however, expresses his regret at the continued refusal of the Board of Education to sanction a dental service or the treatment of ringworm by X rays. Of 1076 routine-inspected children 50 were noted as being poorly nourished, a larger percentage than in 1920.

Swinton and Pendlebury.

Dr. H. C. Mulholland points to the need of hospital treatment for measles, pneumonia, and infantile diseases which cannot be nursed in an overcrowded home. He thinks there is an increased interest in public health matters and hopes this may lead to a demand for cleaner milk, cleaner handling of food, and the abolition of the smoke nuisance. The attendances at the antenatal clinic, conducted by Dr. C. G. Magee, continue to increase, and the results of the work are said to be very encouraging. As an illustration of the need for more houses, it is mentioned that of 561 newly-born infants visited 16 per cent. were born in a house already overcrowded, and 40 per cent. were born in a house occupied by two or more families.

Tottenham.

Dr. David C. Kirkhope reports that the houses completed by his council and the London County Council have not alleviated the housing difficulty to any appreciable extent. The culverting of the brook on the Tewkesbury estate is in progress and is the first really effective step towards making the adjacent properties sanitary. Dr. Kirkhope condemns Circular 325 of the Ministry with regard to milk prosecutions, which had not been withdrawn when his report was issued in March, 1923. Dr. Kirkhope also regrets that the scheme for coördinating the work of all the health nurses employed by the Tottenham Council gives no appearance of coming to fruition. The work of the school medical service continues to grow. The sessions at the minor ailments clinic have had to be increased. A second dentist began work in May. A satisfactory arrangement has been made with the National Hospital for Diseases of the Heart for examination of special cases of heart disease. The large number of children suffering from chronic otorrhœa and in attendance at the minor ailments clinic is disquieting, and a "sure, safe, and simple remedy for the malady is urgently needed."

Willesden.

Dr. George F. Buchan shows the effect of the imposition of the 2*s.* 6*d.* registration fee for attendance at the municipal clinics. The attendances of mothers and "under 5" children fell by 42 per cent. for the first quarter and by 34 per cent. for the full year. There was a similar decline in the attendance of school-children which mostly, at any rate, disappeared on the withdrawal of the registration fee for school-children on July 10th, 1922. Dr. Buchan has to record considerable damage from ophthalmia neonatorum. Of 38 cases, 31 made a complete recovery and two were under treatment at the end of the year. Of the remaining five, three had one eye and two both eyes permanently injured. In the schools treatment was secured for 96·8 per cent. of medical defects and 59·1 per cent. of dental defects. Dr. Buchan again reports that the accommodation at the schools for physically defective children is far from ideal and that, until the ambulance service is improved, full use of the accommodation provided for both physical and mental defectives cannot be made. Housing conditions are unsatisfactory and repairs are not carried out in the workmanlike manner of pre-war days. The manner of feeding the school-children of the South Kilburn area is reported on adversely. The table appointments are still one spoon and the dietary lacks variety. The earlier arrivals scramble through to make room for others, destroying all possibility of order.

Dr. W. J. J. Stewart, the superintendent of the municipal hospital, points out that although scarlet fever is of a mild type, complications show no marked tendency to diminish. Diphtheria, he says, has become more fatal in recent years. Dr. Stewart regrets greatly that the orthopædic clinic for children of pre-school and school age, which has done much good work, will have to be abandoned as the hospital is no longer open to such cases, and the benefit done by this specialised treatment during the last three years will, to a great extent, be undone. A smaller number of maternity cases was admitted; 305 as compared with 407 in 1921. There was no case of a septic nature, no patient contracted an infectious disease, and the only maternal death was that of a woman suffering from advanced tuberculosis. Of the 286 infants born, 8 died from prematurity and 17 were stillborn. Dr. Stewart reports a great increase in the sickness rate of the domestic staff since the arrangement was adopted by which the domestic staff may live outside the hospital.

Obituary.

WILLIAM FORD ROBERTSON, M.D., C.M. EDIN.,

PATHOLOGIST TO THE SCOTTISH ASYLUMS.

Dr. William Ford Robertson, who died on July 17th at the age of 56, was a native of Roxburghshire and received his early education at Daniel Stewart's College and at George Watson's College, Edinburgh. He afterwards joined Edinburgh University, where he graduated M.B., C.M. in 1891, and proceeded to the M.D. degree four years later. He was resident physician to the Royal Infirmary and to the Royal Hospital for Sick Children, Edinburgh, as well as pathologist to the Royal Edinburgh Asylum from 1893 to 1897, when he became pathologist to the Scottish Asylums, a position which he held till the time of his death. The application of modern pathology to mental conditions was a subject which greatly attracted him, and in 1900 he published the result of his studies in a "Text-book of Pathology in Relation to Mental Diseases," which proved an interesting addition to the library of those engaged in similar work, though in some respects, owing to a desire to put forward constructional views as early as possible, it was lacking in completeness. It was not till 21 years later that he published his well-known book on Therapeutic Immunisation in Asylum and General Practice, a work which advanced views in many directions controversial, but which at the same time gave much food for thought. He was ever distressed at the difficulty of preventing mental disease in our present state of knowledge, and his book is a valiant attempt to solve this problem. It covers ground which has still to be tested, and, indeed, Dr. Robertson admitted that "numerous facts new to science are recorded and many heterodox opinions are expressed which are not likely to be accepted without a fight." It was Dr. Ford Robertson who translated Tanzi's "Text-book of Mental Diseases," one of the best presentations of the science of psychiatry of its date (1909). He will be remembered as one of those who strove constantly to correlate mental and physical disease and who succeeded at any rate in stimulating others to further research on these lines.

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INSULIN.[1]

By J. J. R. MACLEOD, F.R.S., M.B., Ch.B. Aberd.,
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF TORONTO.

[Prof. Macleod gave an historical survey of the mass of work published on the relationship between the pancreas and disturbances in carbohydrate metabolism, from that of Brunner in the seventeenth century up to the time when convincing evidence that an antidiabetic hormone does actually exist in the pancreas was furnished by Banting and Best, their experiments being of a different type from those of their predecessors. He continued:—]

It now became apparent that attempts should be made to see whether the crude alcoholic extracts of ox pancreas could be sufficiently freed from those substances which made them unsuitable for subcutaneous administration to diabetic patients, either because of local irritation or general toxic effects. At this stage of the investigation we were joined by J. B. Collip, who, in a remarkably short period of time, succeeded in isolating from the alcoholic extracts, by fractional precipitation with alcohol, a precipitate which contained the antidiabetic hormone in high concentration, and which, in watery solution, could be injected subcutaneously in man without any deleterious effects. At the same time it was also discovered that the blood-sugar is lowered in normal rabbits by subcutaneous injection of extracts containing the antidiabetic hormone, and to this observation was due in large part the rapid progress which it was possible to make in the isolation of insulin. It offered a ready means for testing the relative potency of the various precipitates and filtrates, and of determining the most favourable conditions under which extraction of the gland should be carried out.

Provided with a comparatively simple method for the preparation of insulin, it now became possible to undertake a systematic investigation of its physiological and chemical properties and its possible therapeutic value, and I shall endeavour to describe briefly what has been found, and to indicate, in a general way, what appear to be the most hopeful lines for further research. It seemed advisable at this stage to group the problems demanding immediate investigation, and this was done as follows: 1. The effect of insulin on the respiratory exchange, the distribution of glycogen, and the metabolism of fat in animals rendered diabetic by pancreatectomy. 2. Its therapeutic effect in diabetes mellitus. 3. Its effect on the blood-sugar of normal animals and the symptoms which result from overdosage. 4. Its pharmacological assay. 5. Its effect on the blood-sugar in the various forms of experimental hyperglycæmia. 6. The physiological mechanism by which it lowers the blood-sugar. 7. Its source. 8. Its chemical reactions and its preparation on a large scale. In planning for the investigations of these problems we were in the fortunate position of having the whole-hearted collaboration of several trained workers, not only in my own department (E. C. Noble, J. Hepburn, and J. K. Latchford), but also in that of internal medicine under the direction of Prof. Duncan Graham (W. R. Campbell and A. A. Fletcher).

The Effect of Insulin on the Metabolism of Carbohydrates and Fats in Experimental Pancreatic Diabetes.

From the time carbohydrates are absorbed, mainly as glucose, into the blood of the portal circulation until they are completely oxidised, changes in chemical structure are constantly occurring. These consist, partly, in a condensation of several glucose molecules to form glycogen, and partly in a splitting of the molecule, proceeding through various intermediate stages. The intermediary substances formed at each stage are doubtless in a certain state of equilibrium, one with another. Many of them do not accumulate sufficiently to be detectable by chemical means, being changed into the next stage almost as quickly as they are produced, and at the present time we are limited, in our attempts to follow the various steps in the process, to observations on the concentration of glucose in the blood, the amount of glycogen deposited in the tissues, and the type of combustion occurring in the organism as a whole. In diabetes marked and significant alterations occur in each of these; the blood-sugar rises to a high level, glycogen practically disappears from the liver and becomes decreased in the muscles—except the heart, in which it increases—and the nature of the combustion process, as revealed by the behaviour of the respiratory quotient, becomes changed so as to indicate that no carbohydrate is being oxidised. It is safe to assume that the increase in blood-sugar is secondary to the other changes, but it is difficult in the present state of knowledge to understand the relationship. It has been a favourite hypothesis that the primary fault in diabetes is in the oxidation of glucose, or in the chemical changes which precede this, and that this leads to the drafting to the tissues from the glycogen reserves of a plethora of sugar; a sort of forced-feeding process, as it were. Another hypothesis is that the glucose molecule must become altered in some way before it can be either oxidised or condensed into glycogen, and that this alteration does not occur in diabetes. Through the work of Irvine and his school much light has been thrown in recent years on the structure of the sugar molecule, and it has been shown that besides the well-known α and β varieties of glucose, in which the oxygen linkage is between the first and fourth carbon atoms, there is also a third variety, called γ glucose, in which the oxygen ring is displaced from the normal stable position. The detection of the γ sugars depends mainly on a comparison of the reducing and polarising powers of the solutions, and, by using this method, Winter and Smith have recently published results which they interpret as showing that the alteration in the glucose molecule alluded to above is the production of γ glucose. γ glucose, according to this view, is a necessary preliminary stage in the oxidation of glucose, and, if we suppose that it is also so for its condensation into glycogen, the inter-relationship of the three changes found in diabetes becomes immediately intelligible.

I have dwelt on these theoretical considerations because of their great interest in connexion with the mechanism of the action of insulin. For it is a significant fact that this hormone, when administered to depancreated animals, completely restores to normal each of the three functions. We have repeatedly found, for example, when it is given along with carbohydrate to depancreated dogs, that very large quantities of glycogen become deposited in the liver and that the respiratory quotient becomes raised in the same manner as it does in normal animals with carbohydrate alone. We know also from the work of Banting and Best on depancreated dogs that it reduces the blood-sugar to the physiological level, that the glycosuria disappears, and that the well-being of the animal becomes normal in every regard.

We must conclude, therefore, that insulin is necessary for the metabolism of carbohydrate, and we may suppose that its function is in some way related to the preparation of the glucose molecule for combustion and condensation. But as to whether this preparation consists in a change of α, β glucose into the γ variety cannot as yet be considered as settled. Dr. G. S. Eadie has repeated Winter and Smith's observations, and by strictly following their instructions has obtained similar results. Briefly stated, these results are that after removal of the proteins by phosphotungstic acid and alcohol from normal blood, the dextrorotary power of the filtrate is lower than it should be as calculated from the reducing power, and on standing 24 hours the differences become less, and later they practically disappear. On the other hand when blood from diabetic patients or hyperglycæmic animals is used, the dextrorotary and reducing value correspond from the start, or the former may exceed the latter. Administration of insulin causes the diabetic blood to behave in these regards like normal.

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[1] A lecture (abridged) delivered before the Eleventh International Congress of Physiology at Edinburgh on July 24th.

The question is with regard to the interpretation of the results, and, as Hewlett has pointed out, this need not necessarily be that γ glucose is present, but rather that chemical changes have occurred in the very complicated procedure which is involved in the preparation of the solutions for the polariscope. Others have believed that the blood may contain, besides glucose, other carbohydrates or related substances having a relatively low dextrorotary power. Since this question is not yet settled I need not dwell on the further claim of Winter and Smith that insulin is capable of causing γ glucose to be formed when added to a solution of ordinary glucose along with an extract of liver. I may state, however, that we have so far been unable to confirm this result.

The action of insulin on the metabolism of fat in diabetic animals is equally as striking as it is on that of carbohydrates, and here again its effects are revealed by chemical changes occurring at both ends as it were of the metabolic chain. In a few days after pancreatectomy in the dog, the blood and the liver contain excessive quantities of fat, although the extreme degrees of lipæmia sometimes encountered in diabetic patients have not been observed. There is also a certain degree of acetonuria, although again this is much less pronounced than it is in diabetes in man. Evidently the migration of fat in the body is abnormal, and its final oxidation seriously interfered with. When insulin is given along with carbohydrates to these animals, the acetonuria very promptly disappears, the blood fat, apparently more slowly, returns to normal, and the liver in a few days contains no more fat than that of a normal, similarly fed animal. As the glycogen increases in this viscus the fat correspondingly declines. We cannot state at which stage in the metabolism of fats insulin exercises its corrective influence, but wherever this may be, there can be little doubt that it acts indirectly because of its effect on carbohydrates. It has been said that fat burns in the fire of carbohydrates, and although this generalisation may, in some respects, be misleading it is, nevertheless, a useful one to guide us in interpreting the results with insulin.

The Therapeutic Effects of Insulin in Diabetic Mellitus.

As would be expected, the effects of insulin on patients suffering from diabetes mellitus, in so far as these have been studied, are of the same general nature as those observed on diabetic (depancreated) dogs. Until the laboratory investigations had furnished perfectly definite results no serious attempts were made to carry the investigations into the clinic, nor would it have been permissible to do so in view of the failures of previous workers to provide an extract that did not cause toxic symptoms. Without animal experimentation we would be no further to-day in the treatment of diabetes, and in the undoubted saving of human life which has been the result, than we were a little over a year ago when the treatment was first applied on any considerable scale.

In studying the results obtained by administration of insulin on patients, we must bear in mind, however, that two factors may come into play that are not involved in the experiments on completely depancreated animals. One of these is dependent on the fact that there probably still remains in the majority of diabetic patients a certain remnant of pancreatic tissue capable of secreting insulin; and the other, on certain differences between laboratory animals and man, related in part to peculiarities in the type of metabolism and in part to the greater development of the nervous system, and to which the frequent occurrence of coma as a serious symptom of the clinical form of the disease is due. Moreover, we must remember that subjective phenomena can be studied only on man.

The first case in which a complete study of the therapeutic value of insulin was made was that of a boy of 14 years of age, exhibiting all the classical symptoms of the disease, and on whom treatment by dietetic control had resulted in no improvement. Daily injections of insulin between Jan. 23rd and Feb. 4th, 1922, reduced the blood-sugar even to the normal level, greatly diminished the glycosuria, and often caused it to disappear, removed entirely the ketonuria for a period of some days, and, perhaps most striking of all, "the boy became brighter, more active, looked better, and said he felt stronger." There could be no doubt as to the great therapeutic value of the treatment, when judged both by the improvement in the objective and subjective symptoms of the disease. This, along with other cases treated by insulin, and reported by Banting, Best, Collip, Campbell, and Fletcher, is only the first of a large number, exhibiting the disease in all its forms, that have been most carefully studied in numerous clinics both in Canada and the United States and in this country, and I cannot refrain from expressing my admiration for the excellent spirit of collaboration which has made this possible. I am not qualified, nor even if I were would it be in place for me here to discuss further the clinical results, but I may say that there can be no doubt that insulin is capable, when wisely used under controlled conditions, of saving many cases of diabetes which would otherwise inevitably have succumbed to coma, or to one of the many other complications of the disease. It is also certain that, as an adjunct to dietetic control, treatment with insulin greatly improves the nutritive condition and increases the resistance towards infections, thereby prolonging the expectation of life. The subjective condition and the sense of well-being of the patients are also vastly improved. As to whether continued treatment with insulin will enable the diabetic patient to recover any of his lost power of producing this internal secretion in his own pancreas, nothing definite can be said at present. It is at least significant in this connexion that the islet tissue develops considerable powers of regeneration after much of it has been destroyed as a result of ligation of the secreting ducts of the pancreas, as has been shown by R. R. Bensley to be the case, at least in the rabbit and guinea-pig. Arising as it does in these cases from outgrowths of the duct epithelium, may it not be possible in man, in whom the pancreas has not been completely destroyed by disease, that new islet tissue will become regenerated when, by administration of insulin, the strain to produce this hormone endogenously is removed?

Returning now to the more purely physiological aspects of the subject, let me briefly lay before you what is known regarding the effects of insulin on normal animals. In the consideration of these results we must bear in mind that the conditions in the normal animal are fundamentally different from those obtaining in the diabetic. In the normal animal there is probably available at all times a sufficient amount of insulin for every purpose for which it is required, so that the addition of more from without upsets the metabolic balance and thereby induces an abnormal state. In the diabetic, on the other hand, the injection of insulin only restores to the body a hitherto missing part of the metabolic machinery and enables it to run smoothly again.

The Effect of Insulin on the Blood-sugar of Normal Animals.

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INSULIN.[1]

By J. J. R. MACLEOD, F.R.S., M.B., Ch.B. Aberd.,
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF TORONTO.

[Prof. Macleod gave an historical survey of the mass of work published on the relationship between the pancreas and disturbances in carbohydrate metabolism, from that of Brunner in the seventeenth century up to the time when convincing evidence that an antidiabetic hormone does actually exist in the pancreas was furnished by Banting and Best, their experiments being of a different type from those of their predecessors. He continued:—]

It now became apparent that attempts should be made to see whether the crude alcoholic extracts of ox pancreas could be sufficiently freed from those substances which made them unsuitable for subcutaneous administration to diabetic patients, either because of local irritation or general toxic effects. At this stage of the investigation we were joined by J. B. Collip, who, in a remarkably short period of time, succeeded in isolating from the alcoholic extracts, by fractional precipitation with alcohol, a precipitate which contained the antidiabetic hormone in high concentration, and which, in watery solution, could be injected subcutaneously in man without any deleterious effects. At the same time it was also discovered that the blood-sugar is lowered in normal rabbits by subcutaneous injection of extracts containing the antidiabetic hormone, and to this observation was due in large part the rapid progress which it was possible to make in the isolation of insulin. It offered a ready means for testing the relative potency of the various precipitates and filtrates, and of determining the most favourable conditions under which extraction of the gland should be carried out.

Provided with a comparatively simple method for the preparation of insulin, it now became possible to undertake a systematic investigation of its physiological and chemical properties and its possible therapeutic value, and I shall endeavour to describe briefly what has been found, and to indicate, in a general way, what appear to be the most hopeful lines for further research. It seemed advisable at this stage to group the problems demanding immediate investigation, and this was done as follows: 1. The effect of insulin on the respiratory exchange, the distribution of glycogen, and the metabolism of fat in animals rendered diabetic by pancreatectomy. 2. Its therapeutic effect in diabetes mellitus. 3. Its effect on the blood-sugar of normal animals and the symptoms which result from overdosage. 4. Its pharmacological assay. 5. Its effect on the blood-sugar in the various forms of experimental hyperglycæmia. 6. The physiological mechanism by which it lowers the blood-sugar. 7. Its source. 8. Its chemical reactions and its preparation on a large scale. In planning for the investigations of these problems we were in the fortunate position of having the whole-hearted collaboration of several trained workers, not only in my own department (E. C. Noble, J. Hepburn, and J. K. Latchford), but also in that of internal medicine under the direction of Prof. Duncan Graham (W. R. Campbell and A. A. Fletcher).

The Effect of Insulin on the Metabolism of Carbohydrates and Fats in Experimental Pancreatic Diabetes.

From the time carbohydrates are absorbed, mainly as glucose, into the blood of the portal circulation until they are completely oxidised, changes in chemical structure are constantly occurring. These consist, partly, in a condensation of several glucose molecules to form glycogen, and partly in a splitting of the molecule, proceeding through various intermediate stages. The intermediary substances formed at each stage are doubtless in a certain state of equilibrium, one with another. Many of them do not accumulate sufficiently to be detectable by chemical means, being changed into the next stage almost as quickly as they are produced, and at the present time we are limited, in our attempts to follow the various steps in the process, to observations on the concentration of glucose in the blood, the amount of glycogen deposited in the tissues, and the type of combustion occurring in the organism as a whole. In diabetes marked and significant alterations occur in each of these; the blood-sugar rises to a high level, glycogen practically disappears from the liver and becomes decreased in the muscles—except the heart, in which it increases—and the nature of the combustion process, as revealed by the behaviour of the respiratory quotient, becomes changed so as to indicate that no carbohydrate is being oxidised. It is safe to assume that the increase in blood-sugar is secondary to the other changes, but it is difficult in the present state of knowledge to understand the relationship. It has been a favourite hypothesis that the primary fault in diabetes is in the oxidation of glucose, or in the chemical changes which precede this, and that this leads to the drafting to the tissues from the glycogen reserves of a plethora of sugar; a sort of forced-feeding process, as it were. Another hypothesis is that the glucose molecule must become altered in some way before it can be either oxidised or condensed into glycogen, and that this alteration does not occur in diabetes. Through the work of Irvine and his school much light has been thrown in recent years on the structure of the sugar molecule, and it has been shown that besides the well-known α and β varieties of glucose, in which the oxygen linkage is between the first and fourth carbon atoms, there is also a third variety, called γ glucose, in which the oxygen ring is displaced from the normal stable position. The detection of the γ sugars depends mainly on a comparison of the reducing and polarising powers of the solutions, and, by using this method, Winter and Smith have recently published results which they interpret as showing that the alteration in the glucose molecule alluded to above is the production of γ glucose. γ glucose, according to this view, is a necessary preliminary stage in the oxidation of glucose, and, if we suppose that it is also so for its condensation into glycogen, the inter-relationship of the three changes found in diabetes becomes immediately intelligible.

I have dwelt on these theoretical considerations because of their great interest in connexion with the mechanism of the action of insulin. For it is a significant fact that this hormone, when administered to depancreated animals, completely restores to normal each of the three functions. We have repeatedly found, for example, when it is given along with carbohydrate to depancreated dogs, that very large quantities of glycogen become deposited in the liver and that the respiratory quotient becomes raised in the same manner as it does in normal animals with carbohydrate alone. We know also from the work of Banting and Best on depancreated dogs that it reduces the blood-sugar to the physiological level, that the glycosuria disappears, and that the well-being of the animal becomes normal in every regard.

We must conclude, therefore, that insulin is necessary for the metabolism of carbohydrate, and we may suppose that its function is in some way related to the preparation of the glucose molecule for combustion and condensation. But as to whether this preparation consists in a change of α, β glucose into the γ variety cannot as yet be considered as settled. Dr. G. S. Eadie has repeated Winter and Smith's observations, and by strictly following their instructions has obtained similar results. Briefly stated, these results are that after removal of the proteins by phosphotungstic acid and alcohol from normal blood, the dextrorotary power of the filtrate is lower than it should be as calculated from the reducing power, and on standing 24 hours the differences become less, and later they practically disappear. On the other hand when blood from diabetic patients or hyperglycæmic animals is used, the dextrorotary and reducing value correspond from the start, or the former may exceed the latter. Administration of insulin causes the diabetic blood to behave in these regards like normal.

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insulin-like materials that have been prepared by Collip and others from clams and from various vegetable sources. Indeed, the character of initial fall is such as to give the impression that the process responsible for it must be one operating within the blood itself—an intravascular glycolysis. But this cannot be the case, since we have been unable to find that the addition of insulin to defibrinated blood kept under sterile conditions at body temperature outside the body has any influence on the rate at which sugar disappears; neither is there any difference in this regard between the blood of normal animals and that of animals injected with insulin at varying periods preceding the withdrawal of the blood. Evidently, therefore, the locus of action of insulin is extravascular; it is in the tissue cells. We must conclude that the insulin sets up some process by which, as it were, a vacuum for sugar becomes established in these cells, so that sugar is removed from the blood. One may imagine that in the tissues there exists a certain balance between the concentration of free glucose, the complex carbohydrates from which it may be derived, and the various derivatives into which it breaks down prior to its oxidation. In other words, one may speak of a certain tension of glucose as being necessary in the tissues and consider the action of insulin as having the effect of reducing this tension so that glucose diffuses into them from the blood in order to maintain it.

After about one half-hour the blood-sugar in the rabbit usually begins to rise again, or at least the fall to become much less pronounced, indicating that the effect of insulin is becoming neutralised by the liberation of sufficient glucose from the glycogen stores of the muscles and liver. This, of course, means that the hypoglycæmia following insulin will be much more prolonged and will ultimately become much more pronounced in animals provided with small reserves of glycogen than in those that are rich in glycogen. Such can readily be shown to be the case, and it is significant that a well-fed animal may withstand many times the dose of insulin that would prove fatal to one that was starved.

It is customary to imagine that the glycogenic mechanism of the liver is so finely attuned to respond to the concentration of sugar in the blood that glycogenolysis immediately sets in when this falls below the normal level. That such is not the case following insulin may depend on the fact that the glycogen, which is first of all called upon to maintain the glucose tension in the tissues, is that of the muscles themselves; but we will not here venture further into the various interesting consequences of such an hypothesis. It is at least significant that the glycogen of the muscles, as well as of the liver, is usually reduced in animals that have been given large doses of insulin (McCormack and O'Brien and Dale and Dudley). On account of its practical significance it should be pointed out that it is because of the poverty of the glycogen reserves that the blood-sugar of diabetic patients treated with insulin is more apt to fall suddenly to a dangerously low level than is that of normal persons.

The Hypoglycæmic Symptoms.

When the percentage of blood-sugar has fallen to about 0·045 curious symptoms supervene. These were first observed in rabbits, and in a typical case consist in a violent convulsive seizure in which the animal throws itself over sideways, usually first in one direction, then in the other, with the head retracted and the hind limbs in an extended position. The condition is not unlike that caused by strychnine or by acute asphyxia, except that certain groups of muscles are less affected by the convulsions than others. After a period, usually of from 30 seconds to a minute, the convulsions cease and the animal lies on its side in an unconscious state, perhaps showing running-like movements of the extremities, and with rapid, shallow breathing. The exact condition of the animal at this stage may, however, vary considerably, well-fed and therefore glycogen-rich animals often sitting in apparently normal fashion between the convulsive seizures, which are often brought on by attempts to move. After a varying period the comatose stage is followed by another convulsive seizure, and these phases may continue alternately for an hour or more, the convulsions becoming feebler and feebler and the rectal temperature falling, until at last the animal dies of respiratory failure. After death rigor mortis sets in at once. The arterial blood is venous in colour, and it clots very quickly. Preceding the onset of typical convulsions there are usually premonitory symptoms of hyperexcitability and evidence of hunger; sometimes, however, paralysis of the extremities is the first symptom.

The symptoms vary somewhat in other animals. In the dog the first signs are usually very rapid breathing, restlessness, and general hypersensitivity, muscular twitching then becomes evident and the sphincters may relax. Barking is often a prominent symptom, and there may be frothing at the mouth. At this stage, or as the first symptom, convulsions not unlike those seen in the rabbit may supervene, and between them the animal lies on its side, showing violent twitching of the musculature, almost a tetany. It is evidently unconscious. The rates of breathing and of the pulse increase. Inspiration is usually short and jerky, and inspiratory tetanus not infrequent, so that artificial respiration may have to be applied. Attempts to get on its feet are often the cause for convulsive seizures and, during recovery, the muscles of the extremities, particularly the anterior, are seen to have entirely lost their power of coördinate action. In etherised dogs even massive doses of insulin have no immediate effect on the blood pressure.

In the cat the symptoms are like those in the dog, profuse salivation, mewing, and relaxation of the sphincters being especially marked.

In the mouse kept at room temperature, A. Krogh observed that insulin may only cause the animal to become weak, but its temperature falls to a very low level. If it be kept in an incubator at about 28° C., however, characteristic symptoms supervene—convulsions and coma, preceded by paralysis of the legs—with doses of insulin, which, when compared on a body-weight basis, are only about one-fifth that necessary for rabbits.

This influence of body temperature is particularly interesting, since it probably explains the apparent immunity of frogs even to massive doses of insulin. We failed to note any symptoms even in three days after injecting insulin. but A. Krogh has since found that they occur in a day or so later, a fact which we have confirmed.

In man, in whom the subjective symptoms can be interpreted and cardio-vascular changes more accurately observed, the picture is different. When the blood-sugar reaches about 0·075 per cent. the patient experiences extreme hunger and a sense of fatigue. He usually becomes anxious and may lose his emotional control. Actual tremor of the musculature is rarely seen, but there is a definite sense of tremulousness and some incoördination for fine movements. "Vasomotor phenomena are common; pallor or flushing, sometimes one after the other; a sense of heat, of chilliness, almost always a profuse sweat" (Banting, Campbell, and Fletcher). At lower levels of blood-sugar, acute mental distress, mental disturbances, delirium, and finally coma, with loss of the deep reflexes supervene.

The correspondence between the onset of definite objective symptoms and a blood-sugar percentage of 0·045 in laboratory animals is remarkable. Sometimes, as in starved animals receiving a large dose of insulin, the blood-sugar may be found to be considerably below this level when convulsions first appear. Very occasionally it is decidedly higher, and immediately after a convulsion the sugar may rise somewhat. These facts suggest that the symptoms are the result of the lowering of the tension of glucose in the tissue cells below a certain critical level—a condition of "glucatonia," we may call it—and to which the hypoglycæmia runs parallel. This view is supported

by the striking manner in which the symptoms are almost instantly removed by administration of glucose, and it is of great significance that other hexose monosaccharides have only a slightly beneficial effect, although, of course, their injection causes a marked rise in the reducing power of the blood. Mannose and lævulose seem to be somewhat more efficient than galactose. None of the pentoses or disaccharides has any effect. Injection of epinephrin, subcutaneously, also removes the symptoms, no doubt because it excites the production of glucose out of the glycogen reserves. It is of use, therefore, only when the reserves are considerable, and it should not be depended upon for antidoting the symptoms of glucatonia in diabetic patients, because in them the glycogen stores are apt to be low. A similar relationship between the percentage of blood-sugar and convulsive symptoms had previously been described by Mann and Magath in dogs deprived of the liver; administration of glucose also removed the symptoms, other monosaccharides having only a slight effect.

There can be little doubt, then, that the symptoms are related to a lowering of the glucose tension in the tissues. But we cannot imagine that this, in itself, is responsible for the violent stimulation of the respiratory and muscular centres that evidently occurs. Some unphysiological condition must become developed as a result of the glucatonia, and it has been suggested that anoxæmia may be an important factor. Olmsted and Logan point out that there is a remarkable resemblance between an insulin convulsion and an asphyxial convulsion, and that the arterial blood is invariably intensely venous in colour when convulsions supervene. "It may possibly be that through the lowering of blood-sugar certain oxidative processes become depressed to such a degree that the brain cells are affected in much the same manner as in asphyxia."

Whatever may be the nature of the toxic condition, it is clearly on the cells of the pons and medulla that it acts. It does not, like strychnine, act on the motor centres of the spinal cord, since insulin causes no convulsive symptoms in a decapitate cat, although it may lower the blood-sugar to well below the convulsive level (Olmsted and Logan).

On what particular detail in the chemical structure of the molecule the remarkable specificity of glucose in antidoting the symptoms may depend, cannot as yet be said, but it is evident that, by studying the relative antidoting value of various sugars and substituted sugars, we are furnished with an interesting method for determining the biological significance of the different side chains and of the other molecular arrangements of the glucose molecule.

The Pharmacological Assay of Insulin.

The extent to which insulin lowers the blood-sugar forms the basis for its pharmacological assay, one unit being originally defined by us as the amount which is required to lower it to 0·045 per cent. within four hours in a rabbit weighing 2 kg. and after 24 hours' fasting. Since convulsions supervene at this level, their occurrence can be used as a check on the assay, and when small animals, such as mice, are used, so that large numbers can be injected with varying amounts of insulin, it can be made by observing the onset of the symptoms alone. In this case one mouse unit is defined by A. Krogh as the quantity of insulin which can cause convulsions in 50 per cent. of the animals within two hours, precautions being taken to maintain the body temperature and to standardise the diet. Dale and Burn have also tried this method of assay.

Even when rabbits are carefully selected so as to correspond in weight and in every other particular, are similarly fed prior to the preliminary starvation period, and are injected intravenously so as to obviate any uncertainties in the rate of absorption, the assays as judged either by the blood-sugar curve or the occurrence of convulsions, do not always correspond. Differences in glycogen content, which can never be accurately adjusted, by dieting are probably largely responsible. We have attempted to circumvent these difficulties by confining the observations on the blood sugar to the first half hour after the insulin injections, hoping in this way to circumvent the influence of the glycogen reserves, but with no conspicuous success. Probably the most accurate method of assay is that worked out in Toronto by Dr. F. N. Allen on depancreated dogs. The principle of this method, which was suggested by our clinical associates, is to determine the number of grammes of glucose that a given quantity of insulin can cause to be metabolised while the animal is on a diet containing enough carbohydrate so that there is some glycosuria. He has found that the carbohydrate equivalent of insulin, as it is called, varies somewhat with the weight of the animal and the carbohydrate balance, but that is satisfactorily constant when these conditions are made uniform. It is not likely that this method will succeed in the clinic, because of the varying degree to which different diabetic patients retain the power to produce insulin.

I have said enough about this problem of assay to indicate how difficult it is, and I will not detain you further with detail. It is probably advisable to point out, however, that it has been found advantageous to adopt, for clinical purposes, temporarily at least, a unit which is one-third that of the standard unit as defined above. This is done to obviate the necessity of prescribing fractions of a unit for the treatment of mild cases of diabetes.

The Effect of Insulin in Experimental Hyperglycæmia.

Insulin also lowers the blood-sugar in every known form of experimental hyperglycæmia, whether this be produced by the addition of glucose exogenously or endogenously. With regard to the former type, Eadie has found that when insulin is injected into rabbits coinciding with, or at varying periods preceding the injection of sugar, the curve of the resulting hyperglycæmia becomes greatly altered. When the insulin injection coincides with that of sugar the curve rises to the same height as with sugar alone, but it returns much sooner to the normal level, and when the sugar is given some time after the insulin the curve is not only of shorter duration but is also much less in height. The maximal influence of insulin in suppressing the curve is when the sugar is given at an interval of about 75–90 minutes after the insulin. At longer intervals the curves progressively rise again, the suppressing influence of insulin having, as a rule, disappeared in about eight hours. We have attempted to use these facts as the basis for a method of assay, but with no great success.

Of the endogenous forms of experimental hyperglycæmia, we have studied the effect of insulin on those due to piqûre, to epinephrin, to asphyxial conditions, and to anæsthetics, and Stewart and Rogoff have studied it on the peculiar form due to morphine. The hyperglycæmia which becomes rapidly developed in glycogen-rich rabbits in all of these conditions is greatly depressed, if not entirely absent, in animals injected with insulin, this depending, obviously, on the amount injected. Most attention has been paid to epinephrin hyperglycæmia, because in this case alone is it possible to control the intensity of the hyperglycæmia by varying the dosage. This, it will be seen, offers a method for the assay of insulin, and Eadie has found, when equal quantities of epinephrin are injected into a series of uniformly fed rabbits along with varying quantities of insulin, that there is usually a definite mathematical relationship between the dose of insulin and the extent to which the blood-sugar rises.

Further interest attaches to the antagonistic action between insulin and epinephrin, with regard to the blood-sugar, because they are both hormones, although it is questionable whether the hormonic action of epinephrin is of importance to the animal. It is significant in this connexion that Stewart and Rogoff have found that the hypoglycæmic effect of insulin is not perceptibly different in adrenalectomised as compared with normal animals, thus showing that

insulin-like materials that have been prepared by Collip and others from clams and from various vegetable sources. Indeed, the character of initial fall is such as to give the impression that the process responsible for it must be one operating within the blood itself—an intravascular glycolysis. But this cannot be the case, since we have been unable to find that the addition of insulin to defibrinated blood kept under sterile conditions at body temperature outside the body has any influence on the rate at which sugar disappears; neither is there any difference in this regard between the blood of normal animals and that of animals injected with insulin at varying periods preceding the withdrawal of the blood. Evidently, therefore, the locus of action of insulin is extravascular; it is in the tissue cells. We must conclude that the insulin sets up some process by which, as it were, a vacuum for sugar becomes established in these cells, so that sugar is removed from the blood. One may imagine that in the tissues there exists a certain balance between the concentration of free glucose, the complex carbohydrates from which it may be derived, and the various derivatives into which it breaks down prior to its oxidation. In other words, one may speak of a certain tension of glucose as being necessary in the tissues and consider the action of insulin as having the effect of reducing this tension so that glucose diffuses into them from the blood in order to maintain it.

After about one half-hour the blood-sugar in the rabbit usually begins to rise again, or at least the fall to become much less pronounced, indicating that the effect of insulin is becoming neutralised by the liberation of sufficient glucose from the glycogen stores of the muscles and liver. This, of course, means that the hypoglycæmia following insulin will be much more prolonged and will ultimately become much more pronounced in animals provided with small reserves of glycogen than in those that are rich in glycogen. Such can readily be shown to be the case, and it is significant that a well-fed animal may withstand many times the dose of insulin that would prove fatal to one that was starved.

It is customary to imagine that the glycogenic mechanism of the liver is so finely attuned to respond to the concentration of sugar in the blood that glycogenolysis immediately sets in when this falls below the normal level. That such is not the case following insulin may depend on the fact that the glycogen, which is first of all called upon to maintain the glucose tension in the tissues, is that of the muscles themselves; but we will not here venture further into the various interesting consequences of such an hypothesis. It is at least significant that the glycogen of the muscles, as well as of the liver, is usually reduced in animals that have been given large doses of insulin (McCormack and O'Brien and Dale and Dudley). On account of its practical significance it should be pointed out that it is because of the poverty of the glycogen reserves that the blood-sugar of diabetic patients treated with insulin is more apt to fall suddenly to a dangerously low level than is that of normal persons.

The Hypoglycæmic Symptoms.

When the percentage of blood-sugar has fallen to about 0·045 curious symptoms supervene. These were first observed in rabbits, and in a typical case consist in a violent convulsive seizure in which the animal throws itself over sideways, usually first in one direction, then in the other, with the head retracted and the hind limbs in an extended position. The condition is not unlike that caused by strychnine or by acute asphyxia, except that certain groups of muscles are less affected by the convulsions than others. After a period, usually of from 30 seconds to a minute, the convulsions cease and the animal lies on its side in an unconscious state, perhaps showing running-like movements of the extremities, and with rapid, shallow breathing. The exact condition of the animal at this stage may, however, vary considerably, well-fed and therefore glycogen-rich animals often sitting in apparently normal fashion between the convulsive seizures, which are often brought on by attempts to move. After a varying period the comatose stage is followed by another convulsive seizure, and these phases may continue alternately for an hour or more, the convulsions becoming feebler and feebler and the rectal temperature falling, until at last the animal dies of respiratory failure. After death rigor mortis sets in at once. The arterial blood is venous in colour, and it clots very quickly. Preceding the onset of typical convulsions there are usually premonitory symptoms of hyperexcitability and evidence of hunger; sometimes, however, paralysis of the extremities is the first symptom.

The symptoms vary somewhat in other animals. In the dog the first signs are usually very rapid breathing, restlessness, and general hypersensitivity, muscular twitching then becomes evident and the sphincters may relax. Barking is often a prominent symptom, and there may be frothing at the mouth. At this stage, or as the first symptom, convulsions not unlike those seen in the rabbit may supervene, and between them the animal lies on its side, showing violent twitching of the musculature, almost a tetany. It is evidently unconscious. The rates of breathing and of the pulse increase. Inspiration is usually short and jerky, and inspiratory tetanus not infrequent, so that artificial respiration may have to be applied. Attempts to get on its feet are often the cause for convulsive seizures and, during recovery, the muscles of the extremities, particularly the anterior, are seen to have entirely lost their power of coördinate action. In etherised dogs even massive doses of insulin have no immediate effect on the blood pressure.

In the cat the symptoms are like those in the dog, profuse salivation, mewing, and relaxation of the sphincters being especially marked.

In the mouse kept at room temperature, A. Krogh observed that insulin may only cause the animal to become weak, but its temperature falls to a very low level. If it be kept in an incubator at about 28° C., however, characteristic symptoms supervene—convulsions and coma, preceded by paralysis of the legs—with doses of insulin, which, when compared on a body-weight basis, are only about one-fifth that necessary for rabbits.

This influence of body temperature is particularly interesting, since it probably explains the apparent immunity of frogs even to massive doses of insulin. We failed to note any symptoms even in three days after injecting insulin. but A. Krogh has since found that they occur in a day or so later, a fact which we have confirmed.

In man, in whom the subjective symptoms can be interpreted and cardio-vascular changes more accurately observed, the picture is different. When the blood-sugar reaches about 0·075 per cent. the patient experiences extreme hunger and a sense of fatigue. He usually becomes anxious and may lose his emotional control. Actual tremor of the musculature is rarely seen, but there is a definite sense of tremulousness and some incoördination for fine movements. "Vasomotor phenomena are common; pallor or flushing, sometimes one after the other; a sense of heat, of chilliness, almost always a profuse sweat" (Banting, Campbell, and Fletcher). At lower levels of blood-sugar, acute mental distress, mental disturbances, delirium, and finally coma, with loss of the deep reflexes supervene.

The correspondence between the onset of definite objective symptoms and a blood-sugar percentage of 0·045 in laboratory animals is remarkable. Sometimes, as in starved animals receiving a large dose of insulin, the blood-sugar may be found to be considerably below this level when convulsions first appear. Very occasionally it is decidedly higher, and immediately after a convulsion the sugar may rise somewhat. These facts suggest that the symptoms are the result of the lowering of the tension of glucose in the tissue cells below a certain critical level—a condition of "glucatonia," we may call it—and to which the hypoglycæmia runs parallel. This view is supported

by the striking manner in which the symptoms are almost instantly removed by administration of glucose, and it is of great significance that other hexose monosaccharides have only a slightly beneficial effect, although, of course, their injection causes a marked rise in the reducing power of the blood. Mannose and lævulose seem to be somewhat more efficient than galactose. None of the pentoses or disaccharides has any effect. Injection of epinephrin, subcutaneously, also removes the symptoms, no doubt because it excites the production of glucose out of the glycogen reserves. It is of use, therefore, only when the reserves are considerable, and it should not be depended upon for antidoting the symptoms of glucatonia in diabetic patients, because in them the glycogen stores are apt to be low. A similar relationship between the percentage of blood-sugar and convulsive symptoms had previously been described by Mann and Magath in dogs deprived of the liver; administration of glucose also removed the symptoms, other monosaccharides having only a slight effect.

There can be little doubt, then, that the symptoms are related to a lowering of the glucose tension in the tissues. But we cannot imagine that this, in itself, is responsible for the violent stimulation of the respiratory and muscular centres that evidently occurs. Some unphysiological condition must become developed as a result of the glucatonia, and it has been suggested that anoxæmia may be an important factor. Olmsted and Logan point out that there is a remarkable resemblance between an insulin convulsion and an asphyxial convulsion, and that the arterial blood is invariably intensely venous in colour when convulsions supervene. "It may possibly be that through the lowering of blood-sugar certain oxidative processes become depressed to such a degree that the brain cells are affected in much the same manner as in asphyxia."

Whatever may be the nature of the toxic condition, it is clearly on the cells of the pons and medulla that it acts. It does not, like strychnine, act on the motor centres of the spinal cord, since insulin causes no convulsive symptoms in a decapitate cat, although it may lower the blood-sugar to well below the convulsive level (Olmsted and Logan).

On what particular detail in the chemical structure of the molecule the remarkable specificity of glucose in antidoting the symptoms may depend, cannot as yet be said, but it is evident that, by studying the relative antidoting value of various sugars and substituted sugars, we are furnished with an interesting method for determining the biological significance of the different side chains and of the other molecular arrangements of the glucose molecule.

The Pharmacological Assay of Insulin.

The extent to which insulin lowers the blood-sugar forms the basis for its pharmacological assay, one unit being originally defined by us as the amount which is required to lower it to 0·045 per cent. within four hours in a rabbit weighing 2 kg. and after 24 hours' fasting. Since convulsions supervene at this level, their occurrence can be used as a check on the assay, and when small animals, such as mice, are used, so that large numbers can be injected with varying amounts of insulin, it can be made by observing the onset of the symptoms alone. In this case one mouse unit is defined by A. Krogh as the quantity of insulin which can cause convulsions in 50 per cent. of the animals within two hours, precautions being taken to maintain the body temperature and to standardise the diet. Dale and Burn have also tried this method of assay.

Even when rabbits are carefully selected so as to correspond in weight and in every other particular, are similarly fed prior to the preliminary starvation period, and are injected intravenously so as to obviate any uncertainties in the rate of absorption, the assays as judged either by the blood-sugar curve or the occurrence of convulsions, do not always correspond. Differences in glycogen content, which can never be accurately adjusted, by dieting are probably largely responsible. We have attempted to circumvent these difficulties by confining the observations on the blood sugar to the first half hour after the insulin injections, hoping in this way to circumvent the influence of the glycogen reserves, but with no conspicuous success. Probably the most accurate method of assay is that worked out in Toronto by Dr. F. N. Allen on depancreated dogs. The principle of this method, which was suggested by our clinical associates, is to determine the number of grammes of glucose that a given quantity of insulin can cause to be metabolised while the animal is on a diet containing enough carbohydrate so that there is some glycosuria. He has found that the carbohydrate equivalent of insulin, as it is called, varies somewhat with the weight of the animal and the carbohydrate balance, but that is satisfactorily constant when these conditions are made uniform. It is not likely that this method will succeed in the clinic, because of the varying degree to which different diabetic patients retain the power to produce insulin.

I have said enough about this problem of assay to indicate how difficult it is, and I will not detain you further with detail. It is probably advisable to point out, however, that it has been found advantageous to adopt, for clinical purposes, temporarily at least, a unit which is one-third that of the standard unit as defined above. This is done to obviate the necessity of prescribing fractions of a unit for the treatment of mild cases of diabetes.

The Effect of Insulin in Experimental Hyperglycæmia.

Insulin also lowers the blood-sugar in every known form of experimental hyperglycæmia, whether this be produced by the addition of glucose exogenously or endogenously. With regard to the former type, Eadie has found that when insulin is injected into rabbits coinciding with, or at varying periods preceding the injection of sugar, the curve of the resulting hyperglycæmia becomes greatly altered. When the insulin injection coincides with that of sugar the curve rises to the same height as with sugar alone, but it returns much sooner to the normal level, and when the sugar is given some time after the insulin the curve is not only of shorter duration but is also much less in height. The maximal influence of insulin in suppressing the curve is when the sugar is given at an interval of about 75–90 minutes after the insulin. At longer intervals the curves progressively rise again, the suppressing influence of insulin having, as a rule, disappeared in about eight hours. We have attempted to use these facts as the basis for a method of assay, but with no great success.

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The symptoms vary somewhat in other animals. In the dog the first signs are usually very rapid breathing, restlessness, and general hypersensitivity, muscular twitching then becomes evident and the sphincters may relax. Barking is often a prominent symptom, and there may be frothing at the mouth. At this stage, or as the first symptom, convulsions not unlike those seen in the rabbit may supervene, and between them the animal lies on its side, showing violent twitching of the musculature, almost a tetany. It is evidently unconscious. The rates of breathing and of the pulse increase. Inspiration is usually short and jerky, and inspiratory tetanus not infrequent, so that artificial respiration may have to be applied. Attempts to get on its feet are often the cause for convulsive seizures and, during recovery, the muscles of the extremities, particularly the anterior, are seen to have entirely lost their power of coördinate action. In etherised dogs even massive doses of insulin have no immediate effect on the blood pressure.

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The correspondence between the onset of definite objective symptoms and a blood-sugar percentage of 0·045 in laboratory animals is remarkable. Sometimes, as in starved animals receiving a large dose of insulin, the blood-sugar may be found to be considerably below this level when convulsions first appear. Very occasionally it is decidedly higher, and immediately after a convulsion the sugar may rise somewhat. These facts suggest that the symptoms are the result of the lowering of the tension of glucose in the tissue cells below a certain critical level—a condition of "glucatonia," we may call it—and to which the hypoglycæmia runs parallel. This view is supported

polymerisation to glycogen. Why, then, does insulin cause glycogen to be deposited in the diabetic animal, and why does it inhibit the breakdown of glycogen in experimental hyperglycæmia? The reply, based on the considerations already set forth, is that an excess of insulin beyond that actually required for the control of carbohydrate metabolism develops towards glycogen, an action which is the reverse of that which it has under normal conditions. When insulin is given to the diabetic animal, on the other hand, it supplies a previously missing agency necessary for the oxidation and polymerisation of glucose. To explain the retarding effect which insulin has on glycogen breakdown in experimental hyperglycæmia, we may suppose that the sugar which is produced by this process is a mixture of active and inactive forms, and that insulin, by tending to produce the former in relative excess, disturbs the balance existing between the sugars and glycogen, so that less glycogen is broken down. This suggestion assumes some sort of balanced action between glycogen and its hydrolytic products, for which, however, there is no experimental evidence.

The possibility that glucose disappears because excess of insulin causes its oxidation to be increased has been investigated by observing the respiratory exchange. In the experiments of Dixon, Eadie, and Pember, dogs and rabbits were used. In the former, the results show that insulin causes a very marked increase in oxygen consumption and in respiratory volume and rate, but very little change in the respiratory quotient. These changes do not, however, begin to be evident until from 30–60 minutes after giving the insulin, by which time the blood-sugar has completed its initial fall and stands at about 0·060 per cent., which indicates that the sudden call for sugar on the part of the tissue cells cannot be attributed to its increased oxidative breakdown. There can be little doubt that the increased metabolism is dependent upon the hyperexcitability and the increased muscular tone of the animal. It reaches its acme when convulsions supervene, and it develops either steadily or intermittently. Evidently, as the tension of glucose declines, conditions become established within the nerve centres which excite them and which may be dependent upon an intracellular lack of oxygen. That the development of the symptoms depends on the lowering of the glucose tension is supported by the observation that their severity is lessened by the injection of glucose.

In rabbits, in which it will be recalled increased muscular tone is not so marked a symptom as in dogs, the increase in oxygen consumption does not set in until the convulsions occur—indeed, there is often, if not usually, a drop both in this and in respiratory volume. Sometimes in rabbits the respiratory quotient rises decidedly. It would be rash at this stage to draw definite conclusions from these results, but it is quite plain that the initial fall in blood-sugar, which is primarily what we must attempt to explain, is not due to any increased combustion of glucose.

The remaining possibility that glucose is reduced to substances related to the fatty acids receives some support in certain of the observations from the behaviour of the respiratory quotient. This may rise to over unity without there being any sufficient degree of hyperpnœa, and of consequent "washing out" of CO_2 from the blood to account for it. To be quite certain of this latter possibility, Dixon and Pember have examined the blood removed from dogs at regular, frequent intervals after giving insulin without finding that there is any significant change in the CO_2-combining power. This observation, by the way, also shows that there can be no production of acid substances as a result of insulin, a fact which has also been demonstrated by F. N. Allen from observations on the behaviour of the acid excretion by way of the urine.

We are, therefore, at a loss to explain the cause for the initial disappearance of sugar from the blood; it is not converted into glycogen, its oxidation in the tissues is not augmented, at least until after increased muscular activity sets in, and if some of it does become reduced to fat-like substances this is not an invariable process.

The Source of Insulin in the Higher Animals.

The evidence that insulin is derived in the higher animals from the islets of Langerhans and not from the acinar (zymogenous) cells of the pancreas has, until recently, been of an indirect nature. Continuing the work of Diamare and Laguesse on the comparative anatomy of the islets of Langerhans, Rennie, in 1905, described in detail their relationship to that of the zymogenous tissue in numerous Teleostei. He found, particularly in *Lophius piscatorius*, Myoxocephalus, and the Pleuronectidæ, that the islet cells exist as separate encapsulated glands lying in the mesentery quite distinct and apart from the bulk of the zymogenous tissue, which is usually spread as narrow bands along the branches of the mesenteric blood-vessels. These glands he called principal islets, and he found the largest of them to be situated near the anterior pole of the spleen.

Although the more recently discovered methods of differential staining for islet cells have not been successfully applied to the principal islets, no one has doubted the conclusion of Diamare and Rennie that they are homologous with those of the islets of Langerhans of the mammalian pancreas. The absence of these structures in the zymogenous tissue in the Teleostei supports this view, as does also the fact that in the Elasmobranchi, in which there are no principal islets, the pancreas itself, which is a compact gland, contains abundant islet tissue. In collaboration with Fraser, Rennie investigated the effect of the principal islets, administered by mouth, on diabetic patients, but without results that could be considered to show definite amelioration of the symptoms. In one case an extract of the gland was injected subcutaneously, but the development of toxic symptoms made a repetition of the experiment inadvisable. In view of the now well-established fact that insulin is quite inactive when given by mouth, it is clear why these earlier observations should have failed to yield satisfactory results. Recently, we have reinvestigated the problem, and have found very definitely that alcoholic extracts of the principal islets cause a profound lowering of the blood-sugar of the normal and diabetic animals, including man, when they are injected subcutaneously or intravenously, whereas similarly prepared extracts of the zymogenous tissue have no such effect—indeed, not infrequently, rather cause the percentage of blood-sugar to increase. In contrast to these results, an extract of the pancreas of the skate, which contains islet tissue, has a marked insulin effect,[2] and so also had one prepared from the intercæcal fat of the trout (in which the islets and zymogenous tissue lie separately embedded). The islets are, therefore, the only source of insulin in the bony fishes, and we may conclude that they are also so in the mammals, since in them none of this hormone is produced after pancreatectomy.

This conclusion is supported by the experiments on duct ligation and on grafting already referred to, and by the experiments of Banting and Best, although in all of these there still remained the possibility that partially-degenerated or regenerated zymogenous tissue might be the source of the hormone.

Much attention has been given in recent years to the mechanism of the control of the secretion of glands producing internal secretions, and, since many of those concerned in the production of the external secretions are under nerve control, it has been supposed that this must also be the case with the ductless glands. It cannot be said, however, that much success has attended the various endeavours to demonstrate this nerve control. Since the islets of Langerhans are provided with a rich nerve supply, which is believed to come in large part from the right vagus, and since an increased discharge of their internal secretion, insulin, would be revealed by the behaviour of the

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[2] These extracts have an unusually marked effect in causing violent convulsions.

the adrenals are in no way linked with the internal secretion of the pancreas in the control of sugar metabolism.

The observation that insulin can prevent the hyperglycæmia due to ether is of clinical importance, because it is probably on account of this hyperglycæmia that a large part of the risk of surgical operations on diabetic patients is due. It should be pointed out, however, that the hypoglycæmic action of insulin is much more readily demonstrated by having the animal well under the effects of insulin before the ether is administered, than by giving insulin to animals that are already anæsthetised. This would seem to indicate that diabetic patients should be treated with insulin before being anæsthetised, and, indeed, that this preliminary treatment should extend over several days so that the reserves of glycogen may be augmented. I am informed by my clinical colleagues that insulin is of little avail in combating post-operative coma if its administration is delayed until after the operation.

An interesting antagonism between pituitrin and insulin has been described by Burn. Given in large doses, pituitrin like insulin may inhibit the hyperglycæmia due to epinephrin or to ether, but when insulin and pituitrin are given together to normal animals, instead of there being a greater fall in blood-sugar than insulin alone would produce, there is little change or, it may be, a rise. A dose of pituitrin which in itself has little effect on blood-sugar is thus capable of neutralising the hypoglycæmic action of insulin. This observation has been confirmed by Logan and Olmsted, who have also found that it is necessary to give enormous amounts of insulin to cause any decided decrease in the hyperglycæmia which is present in decerebrate cats still retaining the pituitary gland. When this gland is absent, on the other hand, not only is the hyperglycæmia much less pronounced, as Bazett had suggested it would be, but insulin promptly lowers the blood-sugar and hypoglycæmic convulsions can readily be induced.

All of the forms of experimental hyperglycæmia just alluded to are primarily due to a rapid breakdown of the glycogen of the liver, and that produced by epinephrin may therefore be taken as a type. This does not, of course, warrant the assumption, that some have made, that a hypersecretion of this hormone is the underlying cause of the hyperglycæmia in the other forms. Indeed, Stewart and Rogoff have conclusively shown that such is not the case, with the possible exception of that caused by morphine. Taking epinephrin hyperglycæmia as a type, then, it seemed of interest to compare the amount of glycogen left in the livers of uniformly well-fed rabbits after they had been given equal doses of epinephrin, some of them at the same time also receiving insulin. This observation, made by E. C. Noble, has shown very definitely that the insulin protects the glycogen against breakdown. In one experiment, lasting eight hours, the livers of two animals receiving epinephrin alone contained 1·40 and 1·96 per cent. of glycogen, whereas those of three others which were given insulin along with the same amounts of epinephrin contained 8·12, 6·4, and 3·64 per cent. of glycogen. It is of interest to note that it was necessary to give about 40 times the usual dose of insulin to cause convulsions under these conditions, and that sometimes the convulsions occurred while there was still over 10 per cent. of glycogen remaining in the liver. The results show quite clearly that insulin antidotes the glycogenolytic action of epinephrin.

The Physiological Mechanism by which Insulin lowers the Blood-Sugar.

And now we are arrived at a stage where it will be advantageous to consider briefly the possible mechanism of the hypoglycæmic action of insulin. We have presented evidence that this is not because it stimulates increased glycolysis within the blood itself, and have concluded that insulin in some way lowers the tension of glucose in the tissue cells.

Further evidence that insulin causes the sugar to pass from the circulating fluid into the tissues more quickly than normal has been furnished by perfusion experiments on the isolated mammalian heart. Hepburn and Latchford, using Locke's method, found, as previous workers have, that an average of 0·9 mg. of glucose per gramme of (rabbit) heart per hour disappears from the perfusion fluid. By adding insulin to the perfusion fluid the average sugar consumption rose to over 3·0 mg., and in some cases reached the value of over 4·0 mg., the highest without insulin being below 2 mg. They did not find that insulin affected the heart-beat, nor could they detect any significant differences in the glycogen content of the hearts used in the two groups of experiments.

Hoping to be able to demonstrate a similar effect of insulin on the sugar content of fluid perfused through skeletal muscles, these workers attempted to perfuse the hind limbs of various laboratory mammals, but although every possible precaution was taken to avoid interruption of the circulation prior to starting the perfusion, or a fall in temperature, they could never succeed in preventing either marked œdema or vaso-constriction. This failure led them to compare the sugar concentration of blood removed at the same time from the femoral artery and vein, and from the portal vein, of anæsthetised or decerebrated animals, and to see whether insulin would cause the differences normally existing between these bloods to become changed. It was found not to do so. McCormack has since found that this method is also incapable of revealing an increased retention of glucose as a result of insulin, either in the muscles or in the liver of depancreated animals, in which, as we have seen, insulin certainly causes glycogen to be formed. This shows that the method is not sufficiently sensitive for the purpose for which it was employed.

The evidence of the observations on glycolysis and the perfused heart leave little doubt, however, that the glucose is lost in the tissue cells, and the problem narrows itself down to the cause for its disappearance. The possibilities that may be considered are: its polymerisation into glycogen, its oxidation, and its reduction to substances similar to fatty acids.

With regard to its possible conversion into glycogen, the fact that insulin causes large amounts of this polysaccharide to become deposited in the liver of depancreated animals when they are fed on carbohydrates would seem at first sight to lend support. But the conditions, as already pointed out, are fundamentally different in the normal organism. As a matter of fact, it has been shown that insulin given to normal rabbits, instead of causing glycogen to be deposited, has the opposite effect, and either prevents the deposition of glycogen when it is given along with carbohydrates to previously starved animals (McCormack and O'Brien), or causes the stores of this substance to become reduced when given to well-fed animals (Dale and Dudley).

Further evidence that insulin does not stimulate the formation of glycogen in normal animals has been obtained by Noble by perfusion experiments on the liver of the turtle. When each of the two lobes is perfused for several hours with Ringer's solution containing glucose, under exactly similar conditions except that the fluid on one side contains insulin, the relative amounts of glycogen in the two lobes were found to be the same as they usually are. Since the normal variation may be considerable, the method is not a very delicate one, and on this account Noble has also used that of observing the sugar content of the perfusion fluid, as recommended by Snyder, Martin, and Levin. By comparing this for equal periods of time, with and without the addition of insulin, no differences could be detected. The only objection to the experiment is that insulin may not act quickly enough in the case of cold-blooded animals to make it possible in the time of perfusion for measurable quantities of glycogen to be deposited.

Clearly, therefore, none of the disappearance of sugar from the blood of normal animals which follows the injection of insulin can be accounted for by its

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blood-sugar, McCormack and O'Brien have investigated the effect which is produced on the latter by electrical stimulation of the right vagus, in decerebrate cats and in etherised dogs and rabbits. To avoid cardio-inhibitory effects, the nerve has either been stimulated below the origin of the cardiac fibres, or it has been allowed to undergo partial degeneration. The fact that hyperglycæmia follows stimulation of the great splanchnic nerve further suggests the possibility that hypoglycæmia might result from stimulation of the vagus.

Similar observations were made some years ago by de Corral working in Asher's laboratory, with results which are at least suggestive. Those of the present investigation are more definite, although not entirely convincing. In many cases no change can be detected in the level of the blood-sugar following the stimulation but in several others there is a prompt fall, which is usually of a temporary nature, in spite of continued stimulation. In one or two cases, however, stimulation with slow, weak induced shocks for a long period has caused a gradual decline in blood-sugar, in one case to 0·070 per cent., with a return towards the normal level after removal of the stimulus. It is of great interest in connexion with these experiments that Best and Scott have recently discovered that insulin can be prepared from blood by the usual methods.

The Chemical Reactions and the Preparation of Insulin.

Before concluding, allow me to say a few words concerning the methods used in the preparation of insulin and its chemical properties, in so far as these are known at present. The method of preparation developed by Collip depends on the solubility of insulin in concentrations of ethyl-alcohol up to about 90 per cent., above which it becomes precipitated. Since most proteins are insoluble at concentrations of alcohol that are considerably below this, they can be removed from the original extract of pancreas (which is made with 50-60 per cent. alcohol) by fractional precipitation after the extract has been concentrated by evaporation in vacuo. A watery solution of the precipitate which settles out at a concentration of 90 per cent. alcohol is insulin. It can be evaporated to dryness in vacuo without loss of potency, and the powder contains about 14 per cent. of nitrogen, is free from phosphorus (Doisy, Samogyi, and Shaffer), but contains sulphur. A solution gives a distinct biuret test, but only faintly, those of Millon and Hopkins-Cole. The insulin is readily absorbed by kaolin and charcoal, and considerable losses are apt to occur in passing it through a porcelain filter. It does not dialyse through membranes or collodion sacs; it is precipitated by half-saturation with ammonium sulphate, by barium salts of weak acids, and by picric acid. The solubility in water and alcohol is determined by the H-ion concentration, the iso-electric point being at a pH between 5 and 6. Watery solutions at a pH below 5 can be boiled for several hours without any loss in potency, but this occurs more rapidly when the pH is about 7. The potency quickly vanishes in the presence of pepsin or trypsin. In acid solution insulin is relatively stable to mild oxidising and reducing agents. Insulin is also soluble in phenol and the cresols, glacial acetic acid, and formamide. It is insoluble in most other organic solvents (Malony).

These reactions, and its destruction by pepsin and trypsin, suggest that insulin is of the nature of an albumose, but it is possible that it is really only adherent to this protein, and is itself of much simpler chemical structure. This view is supported by the fact that we have been unable on several occasions to detect any biuret reaction with insulin prepared from the pancreas of the skate or to obtain from this source precipitates containing it by means of high concentrations of alcohol, or by adjustment of the iso-electric point. Whether it is really a protein or not, it is significant that all the methods now used for its purification are based on reactions that are characteristic of colloids. Thus precipitation at the iso-electric point (Doisy, Samogyi, and Shaffer), or by picric acid followed by the regeneration from the picrate as a hydrochloride (Dudley), or by benzoic acid (Malony), or by half saturation with ammonium sulphate. It is highly creditable to those who have been responsible for producing insulin on a large scale for clinical use that they should have succeeded in so short a time in their work.

It may be assumed that insulin is present in all animals, and since structures similar to the islets of Langerhans have not been described in the invertebrates, it is likely that in them its site of production is delegated to other structures. What these may be in the more highly-developed invertebrates is as yet undetermined, but it is of interest that Collip, shortly after isolating insulin from mammalian pancreas, prepared it from clams, and suggested that it must be present wherever glycogen is found. Later he prepared a substance like it from yeast, thus confirming Winter and Smith. The insulin prepared from these sources appears to differ from that prepared from pancreas, in that its action in lowering the blood-sugar is delayed, sometimes for a day or so, which is also the case with an insulin-like substance prepared by Collip from various vegetable sources and styled by him, in recognition of these differences "glucokinin." Best and Scott have also succeeded in preparing insulin, or insulin-like substances, from various other sources. It would appear, therefore, that the distribution of hormones capable of accelerating the disappearance of glucose from the blood is widespread, not only in the animal kingdom but in the vegetable as well, but it is probable that these do not all have the same physiological action. In the investigation of this we must bear in mind that many substances have been known for long to be capable of lowering the blood-sugar; for example, peptone, hydrazin, certain mineral salts, phlorhizin, &c. All of these also cause glycogen to disappear from the liver, and, indeed, certain of them cause structural changes in this organ. Although it would certainly be desirable to have substances like glucokinin having a more prolonged action than insulin in depressing the blood-sugar, we must exercise some caution in recommending them for clinical use until it is certain that they have no deleterious effects on the liver. It is possible also that these substances merely stimulate the secretion of insulin from the pancreas of the animal into which they are injected, or serve as precursors for its production. If such be the case, then they can have little value in diabetes.

I have endeavoured in this review to adhere strictly to ascertained facts, and have refrained from venturing to speculate with regard to the numerous problems in metabolism, both of animals and plants, for the investigation of which insulin may prove a useful instrument. If I have succeeded in giving you a bird's-eye view, as it were, of the results that have been obtained, I shall consider that my efforts have not been in vain, and I shall feel repaid if, as an outcome, others join us in the work on insulin.

KING'S COLLEGE HOSPITAL FESTIVAL DINNER.—The Festival Dinner of King's College Hospital was held on July 17th at the Savoy Hotel, the Duke of Connaught in the chair. The Duke of Connaught, in proposing the toast of the hospital, spoke of the anxiety given by the present position of the London hospitals to those whose duty and privilege it was to conduct their work, and referred to the fact that King's College Hospital was the first that gave accommodation as a military hospital (No. 4 London General Hospital) during the war. During the time when the hospital was in military hands some 31,000 soldiers passed through its wards, together with 11,000 civilians; over 370 past and present members of the medical school, and over 150 trained nurses served with the forces. Unfortunately the war occurred at the time when the appeal for the new hospital was being made, and the building debt at the end of 1922 amounted to £73,000. He associated with the toast of the hospital the name of Viscount Hambleden, its chairman. Viscount Hambleden, replying, emphasised the value of the voluntary hospital system, and stated that during the past year the 5600 in-patients and 42,000 out-patients had themselves given £13,000 towards the cost of their maintenance. At the close of the proceedings the Duke of Connaught announced that £6000 had been subscribed during the evening.

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Parliamentary Intelligence.

HOUSE OF LORDS.

THURSDAY, JULY 19TH.

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Therapeutic Substances Bill.

Lord ONSLOW also introduced a Bill entitled the Therapeutic Substances Bill, to provide for the regulation of the manufacture, sale, and importation of certain vaccines, sera, and other therapeutic substances. The Bill was read a first time.

Sale of Liquor to Children.

Viscount ASTOR, in moving the second reading of the Intoxicating Liquor (Sale to Persons under Eighteen) Bill, which has passed through the House of Commons, denied that it was a class measure or that it was a step towards prohibition. He pointed out that Sir Thomas Horder, a prominent member of the Anti-Prohibition League and a distinguished member of the medical profession, together with three other distinguished physicians and surgeons, wrote to the *Times* supporting the Bill and urging its passage. He claimed that there was behind the Bill an overwhelming measure of public support.

Lord DAWSON OF PENN said that he would have been more happy if he had heard from Lord Astor one word of grudging approval of alcohol for people of any class whatever. One could not shut one's eyes to the fact that quite a large proportion of the people who supported this Bill were people who looked upon alcohol as a harmful thing in itself and therefore specially harmful for youths and adolescents. Alcohol was without doubt a food, but that it was a good and effective food in health no sensible person would contend, whatever it might be in sickness. His own view and that of others was that alcohol was a stimulant, though only for a transient period. Its chief effect was on the nervous system. Anyone who referred to it as a narcotic was a scientific philistine, and either his personal experience had been unfortunate or they might console themselves with a thought that after he had called it a narcotic he might presently be seen at home enjoying a glass of old port. To call alcohol a narcotic was a misnomer. In excess it might be a narcotic, but in moderation it added to the pleasure, the exhilaration, the happiness, and the gaiety of life. In the conditions of modern civilisation, in these days of concentration with the constant endeavour to put 12 hours into six, the higher measure of specialisation in modern employment, it was obvious that at the end of such a day the mind of a man got into one track. It was there that the value of alcohol came in. In moderation it got the man out of the track, lightened his mental touch, and enabled him to travel from one topic to the other. He happened to be at a public dinner not very long ago when the centre table consisted almost entirely of prohibitionists, among them several high ecclesiastics of the Church. It was the one dull grey spot in the whole of that dinner, and if anyone wished to be converted to an uncompromising condemnation of prohibition they would have been converted by that scene. There were a number of people who at the end of a fatiguing day were quite unable to digest their food because their nervous system was too tired. A small quantity of alcohol made them happy with themselves and happy with the world. In the particular phase of civilisation we were passing through there had been no time when alcohol, properly taken in proper quantities and in moderation, could serve a more useful purpose. The second effect of alcohol —namely, narcotism—followed in youth very much more quickly than in adult years. The argument for this Bill was that youth did not require alcohol; if it got into one track it got out of it quickly—sometimes too quickly. If the true uses of alcohol were more readily recognised by reformers their influence would be considerably greater. An enormous deal depended on the quality of alcohol. They might take alcohol in absolute purity and dilute it and drink it, and they would get effects totally different from those which followed drinking a good glass of wine or beer. They might submit the samples to analysis, and they would find no difference between the one and the other. The qualities of good wine and beer were due to traces of unponderable substances which might be compared to vitamins in food. The whole good effect of alcohol depended on moderation. He thought it would be universally admitted that moderation was progressing by leaps and bounds. He had got out the figures of a large hospital in London for ten years, and he selected two diseases which were exclusively produced by alcohol. In 1900 there were 30 cases of sclerosis of the liver admitted into that hospital; in 1920 there were seven. He then selected an alcohol disease peculiar to women, and he found for 1900 there were 19 such cases and in the year 1920 only one. Take all the diseases due to alcoholism in that hospital per 1000 of the male patients. In the year 1900 there were 5 per 1000, in 1910 4 per 1000, and in 1920 under 1 per 1000. It seemed to him only logical that they should protect youth from alcohol, and with that *caveat*, that this Bill did not carry with it any condemnation of alcohol as such, he supported its provisions. The second reading of the Bill was agreed to.

HOUSE OF COMMONS.

WEDNESDAY, JULY 18TH.

Grants to Local Authorities.

THE House went into Committee on the Expiring Laws Continuance Bill, Captain Fitzroy in the chair.

Mr. WILLIAM WATSON said that the duties of medical officers and sanitary inspectors had increased very considerably during the period of the war and since. Quite a number of Acts of Parliament had been passed increasing those duties, with the result that the salaries of these officials had been increased during the past few years. By the Local Government (Emergency Provisions) Act, 1916, the grants given by the Government were stereotyped and they stood at the same figure to-day as they did in 1915, and he appealed to the Government to strike this provision out of this Bill so that the local authorities in Scotland might get the relief to which they were entitled.

Captain ELLIOT (Parliamentary Under-Secretary of Health for Scotland) said that by dropping this provision in the present Bill, as suggested by the hon. Member, they would not increase the sum allocated to Scotland for payment of grant-in-aid of rates. The question of grants in relief of local rates was under consideration by an estimates committee, and he had every hope that this was the last year that they would bring forward a provision of this kind.

Coroners and Juries.

Lieut.-Commander KENWORTHY moved to omit Section 7 of the Juries Act, 1918, as amended by 12 and 13 Geo. 5, c. 2. This section gave power to a coroner to dispense with a jury altogether. It therefore lay with the coroner to suspect murder or manslaughter. He suggested that the coroner might not be seized of all the circumstances.

Sir KINGSLEY WOOD said he would like to see the old jury system reverted to because he thought it was one of the best features of English law.

Mr. F. GRAY said that under the Coroners Act of 1887 the coroner had considerable power in determining whether there should or should not be an inquest in a particular case. He had always been impressed by the fact that a large percentage of the cases in which inquests were held were in respect of poor people and workers. The reason was two-fold. First, it was only when an inquest was held that the doctor who had been called in was able to get the substantial fee of 2 guineas for conducting the post-mortem examination, with an additional guinea for attending to give evidence at the inquest. The second reason was that in a large number of cases where a sudden death occurred in the house of a well-to-do person it was notorious that very considerable pressure was brought to bear on the coroner to induce him to abstain from having the unpleasant publicity of an inquest. The power conferred by the Act of 1887 in this respect was probably too wide. When an inquest was held and a jury was called together, if it served no other purpose, it brought publicity to bear on the matter in hand.

Mr. G. LOCKER-LAMPSON (Under-Secretary to the Home Office) agreed that this was a very important question. The section under review was, however, put down originally as a war measure in order to avoid having to summon more people than was necessary. It had been found very useful, had saved a great deal of expense, had worked perfectly smoothly, and had given general satisfaction to the public. The coroner had not to take power to dispense with a jury unless the circumstances of the case justified it. He thought that that was really a sufficient safeguard so far as this temporary measure was concerned. He believed that a promise had already been made that legislation was going to be introduced to consolidate and amend the law relating to coroners, and when the time came an amendment of this particular Section 7 of the Act of 1918 would be very carefully considered.

After further discussion the amendment was negatived by 214 votes to 157.

Visit of Distinguished Russian Scientist.

Mr. RILEY asked the Under-Secretary of State for Foreign Affairs if he was aware that the distinguished Russian scientist, Pavlov, invited to attend the Edinburgh Congress on Physiology, had been refused the visa to his passport by the British consul in New York, and what was the reason or reasons for such refusal.—Mr. LOCKER-LAMPSON (Under-

Secretary for the Home Office) replied: My right hon. friend has no information as to the refusal of a visa to Prof. Pavlov in New York. I understand, however, that he has already sailed from America, and no obstacle will be placed in the way of his landing in this country to attend the Congress on Physiology at Edinburgh.

Milk-feeding Experiments.

Mr. Hurd asked the Minister of Health whether he could state in general terms the results of the milk-feeding experiments among Birmingham council school-children, showing the physiological value of fresh milk as an article of diet, and particularly the effect on children suffering from malnutrition of the addition to their dietary of a pint of fresh milk daily, and whether he would cause to be prepared and published a report on the experiments for the encouragement of coöperative movements of the same kind between other educational, agricultural, and health authorities.—Mr. Neville Chamberlain replied: It would not be possible within the limits of an answer to a question in this House to state even in general terms the results of the experiments referred to in the first part of the question. As regards the second part, I think the question of publishing a report on the results of these experiments is a matter for the authority responsible for the investigation. I may add that the Ministry of Health, in conjunction with the Medical Research Council, are conducting investigations into the nutritive properties of milk in the feeding of children, and the question of issuing a report on these investigations will be considered.

Poor-Law Officers' Superannuation.

Mr. Hayday asked the Minister of Health whether he was aware that an employee in a fever hospital paid for superannuation under the provisions of the Poor-Law Officers Act; that if for any reason the employee was transferred to a mental hospital, even if it was controlled by the same authority, he came under the Asylum Officers Act for superannuation purposes; that as there were no provisions in either Act for transfer value the employee lost credit for all the payments he made under the Poor-Law Officers Act although if he were dismissed instead of transferred he would get his payments returned, and whether he would take action to bring these two Acts into conformity with the provisions of the Local Government and other Officers Superannuation Act, 1922.—Mr. Neville Chamberlain replied: I am aware of the difficulty to which the hon. Member refers, but I am afraid I cannot promise to introduce legislation dealing with the matter at the present time.

Houses under the New Bill.

Captain Wedgwood Benn asked the Minister of Health the number of houses approved for construction to date under the new Bill.—Mr. Neville Chamberlain replied: The number of houses approved to date which will rank for assistance under the new Bill is 16,215.

Small-pox Commissioners.

Mr. Albert Bennett asked the Minister of Health the number of small-pox commissioners appointed at present in the country and the districts in which they were operating, and what were their duties and the degree of coördination they observe with respect to the medical advisers of local authorities.—Mr. Neville Chamberlain replied: There appears to be some misapprehension as to the nature of the arrangements to which the hon. Member refers. These arrangements have been made solely with a view to securing promptly an accurate diagnosis in suspected cases of small-pox. In ordinary circumstances, if the doctor in attendance upon a patient and the local medical officer of health are doubtful whether the case is one of small-pox, arrangements are made if possible for one of the medical officers of my department who have special experience in the diagnosis of the disease to see the patient in consultation with the practitioner and the medical officer of health. The recent outbreaks of small-pox have rendered it necessary that some further assistance should be available for the diagnosis of doubtful cases, and I have secured the services of 12 medical men residing in different parts of the country, each of whom has special knowledge and experience of small-pox, to visit suspected cases when assistance is sought from my department and the services of medical officers of the Ministry are not immediately available. The sole object of these visits is to assist in diagnosis, and the medical men who have been appointed endeavour in each case to arrange to see the patient in consultation with the medical attendant and the local medical officer of health.

THURSDAY, JULY 19TH.

Medical Boards and Final Awards.

Mr. Whiteley asked the Minister of Pensions whether, seeing that out of 13,023 cases heard by the assessment appeal tribunal in the six months ending Dec. 31st, 1922, the assessment was increased in 2500 cases and the final award set aside in 2500 cases, he would issue instructions to the members of final award boards that in arriving at their decisions every regard must be paid to the prospective condition of men suffering from a temporary or permanent disablement due to war service, and whether he would withdraw Supplement No. 3b to M.P.M.S.D. 57, informing the boards that they were expected to make final awards.—Major Tryon replied: The medical boards concerned have already been instructed in the sense suggested by the hon. Member in the first part of his question. I am not prepared to adopt the suggestion in the last part of the question. The instruction referred to was issued in the interests of disabled men for the reasons which I stated in the course of debate on Committee of Supply on the 5th ultimo.

Allowances for Home Treatment.

Mr. Herriotts asked the Minister of Pensions whether, in all cases where a pensioner was recommended home treatment with allowances, the recommendation was referred to a deputy commissioner of medical services; whether he had power to veto such recommendations; whether any record was kept of the number of cases where authority to pay allowances is refused; and, if so, would he give the number of men who were recommended home treatment with allowances but did not receive allowances in the three months ending March 31st.—Major Tryon replied: Certificates given by Ministry institutions and clinics are not referred to a deputy commissioner of medical services, but where the examination has been conducted by an out-station medical officer his recommendation is referred to a deputy commissioner. The latter never disturbs a recommendation of allowances without personally seeing the man unless the examining medical officer agrees, on reconsideration of the case, that allowances are not admissible. I regret that the figures asked for are not available, as no record is kept of these decisions other than in the man's personal file.

Medical Commissioner and the Welsh Language.

Mr. Robert Jones asked the Minister of Pensions whether the deputy commissioner of medical services (tuberculosis), Wales region, was attached to the South-Western region: whether he had any knowledge of the Welsh language; and, if not, whether he would consider the appointing of an officer able to speak the language of the country in which he had to carry out his duties.—Major Tryon replied: The answer to the first part of the question is in the affirmative. I have no definite knowledge of this officer's acquaintance with the Welsh language, but as he has been performing his duties satisfactorily I assume that he has had no difficulty in understanding and making himself understood by pensioners in the Principality.

Dental Inspection in Wales.

Mr. Robert Jones asked the Minister of Pensions whether the deputy commissioner of medical services (dental) as part of his duties had to satisfy himself by personal examination as to the quality of the work done by each dentist; how many dentists were there on the dental panel for Wales; how many dentures did the deputy commissioner of medical services (dental) examine in the 12 months ending March 31st, 1923; and in how many cases was the work unsatisfactory.—Major Tryon replied: The answer to the first part of the question is in the affirmative. Recent figures are not available, but during the year ended November, 1922, this officer examined personally 404 individual cases where dental treatment was provided, a considerable proportion of which had to be referred back for further treatment or for adjustment. There are about 60 dentists on the panel in Wales.

Panel Doctors and Treatment Allowances.

Mr. Robert Morrison asked the Minister of Pensions for what reason the Ministry refused to grant treatment allowances on the certificate of a man's panel doctor that the man was unable to work.—Major Tryon replied: Treatment allowances are payable only when a medical officer of the Ministry is satisfied that the nature of an approved course of treatment is such as to prevent the man from providing for his own support and that of his family. Full consideration is always given to any opinion expressed by the panel doctor on the requirements of any treatment approved.

Insane Prisoners.

Sir Robert Newman asked the Secretary of State for the Home Department whether he could state how many persons during the last four years had become insane and been certified as such while undergoing terms of imprisonment; whether any of them had died in that condition before being released from custody; and how many convicted persons during the last four years had committed suicide while serving a sentence of imprisonment.—Mr. Bridgeman replied: The number of convicted, debtor, and surety prisoners certified insane in prison during the last four years is 432. None of these persons died while still in prison and before removal to an asylum. I have no information as to how many of these persons died before they were discharged from asylums. During the same four years 28 prisoners committed suicide in prison.

Nurses and Registration.

Dr. CHAPPLE asked the Minister of Health whether he could state the number of nurses who had applied for registration under the Nurses Registration Act, 1919, up to July 14th, 1923; and whether existing nurses would be eligible for registration if otherwise qualified, should their applications be received within a period of two years from the date on which the recent order came into operation.—Lord EUSTACE PERCY replied: I am informed that up to July 14th 40,436 applications had been received. After this date the council have no power to admit applications for registration as an existing nurse, and the reply to the second part of the question is, therefore, in the negative.

FRIDAY, JULY 20TH.

Small-pox at Brockworth Aerodrome.

Mr. RHYS DAVIES asked the Minister of Health whether any of the patients at the Brockworth aerodrome had actually died as a result of small-pox and, if so, what were their ages; whether they were vaccinated either before or after reaching the aerodrome; and how long had they been at the aerodrome.—Mr. NEVILLE CHAMBERLAIN replied: So far as I am aware, there have been three deaths among small-pox patients at the Brockworth aerodrome. The first was an unvaccinated man, 58 years of age, who died, five days after admission, as a result of cerebral hæmorrhage and delirium tremens whilst suffering from a mild attack of small-pox. The second was an unvaccinated child, 6 weeks of age, who died from small-pox seven days after admission to hospital. The third was an unvaccinated child, 10 months of age, whose death, 12 days after admission to hospital, was due to small-pox, complicated by enteritis and heart failure.

MONDAY, JULY 23RD.

Mortality from Small-pox.

Mr. LUNN asked the Minister of Health what was the annual mortality per 1,000,000 living from small-pox at ages under 15 years for the periods 1861–70, 1871–80, 1881–90, 1891–1900, 1901–10, and 1911–20.—Mr. NEVILLE CHAMBERLAIN replied: These particulars are only available for the usual age groups for ages under 15—viz., 0–5, 5–10, 10–15—shown in the table below:

	0–5	5–10	10–15
1861–70	638	145	56
1871–80	518	285	138
1881–90	80	33	26
1891–1900 ..	29	10	3
1901–10	22	7	6
1911–20	0·57	0·32	0·11

Pernicious Anæmia.

Sir ROBERT NEWMAN asked the Minister of Health whether he possessed any statistics concerning deaths from a complaint known as pernicious anæmia; if so, whether he could state if the deaths arising from that complaint had considerably increased of late years; and whether a considerable number had occurred among ex-Service men.—Mr. NEVILLE CHAMBERLAIN replied: Separate figures in regard to pernicious anæmia are not available for years prior to 1920, but as the bulk of the deaths included under the heading anæmia are due to pernicious anæmia, the figures in the following table may be of use. Figures are not available for ex-Service men as a whole, but I am informed by the Ministry of Pensions that as regard ex-Service men pensioned for injuries or disabilities, 152 out of a total of 60,000 deaths were due to pernicious anæmia.

Death-rate per Million Living.

—	Anæmia.		Pernicious anæmia.		Other forms.	
	Males.	Females.	Males.	Females.	Males.	Females.
1911	48	60	—	—	—	—
1912	49	63	—	—	—	—
1913	54	65	—	—	—	—
1914	56	72	—	—	—	—
1915*	69	75	—	—	—	—
1916*	69	74	—	—	—	—
1917*	74	74	—	—	—	—
1918*	69	60	—	—	—	—
1919	57	71	—	—	—	—
1920	61	71	55	62	6	9
1921	62	84	55	74	7	10
1922	68		61	74	7	10

* The figures for the years 1915–1918 are based on the civilian population.

TUESDAY, JULY 24TH.

The Army Medical Service.

Mr. BECKER asked the Under-Secretary of State for War if, in view of the unpopularity of the Army Medical Service at the present time, he would recommend that young medical men should be invited to serve three, five, or seven years, with a gratuity at the end of service, so as to maintain a steady flow of young men into the Service.—Lieut.-Colonel GUINNESS replied: It is already open to army medical officers to retire with gratuity after eight and a half years' service. I do not think the shortening of this period is desirable, or administratively practicable, having regard, for instance, to the requirements of the army in India.

Small-pox at Gloucester Aerodrome.

Mr. LEACH asked the Minister of Health whether he would arrange for photographs to be taken of half a dozen of the most representative cases of small-pox at the Gloucester aerodrome, so that medical officers could be made familiar with the symptoms of the disease that was diagnosed as small-pox to-day.—Lord E. PERCY replied: I understand that photographs of some of these cases have already been taken, but I am advised that a study of such photographs would not be of much assistance to medical men in the differentiation of symptoms of small-pox.

Appointments.

GIMBLETT, C. L., M.D. Camb., M.R.C.P. Lond., F.R.C.S. Eng., has been appointed Hon. Ophthalmic Surgeon to the Royal Northern Hospital.

SOUTHAM, A. H., M.D., M.Ch. Oxon., F.R.C.S.Eng., Assistant Surgeon, Manchester Children's Hospital.

Vacancies.

For further information refer to the advertisement columns.

Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £120.
Cardiff Royal Infirmary.—Two Hon. Dental Surgs.
Carmarthenshire Education Committee.—Chief School M.O. £700.
Cumberland County Council.—Asst. County M.O.H. £500.
Devonport, Royal Albert Hospital.—H.S. £150.
Durham County Hospital.—H.S. £200.
Earlswood, Royal Earlswood Institution.—Med. Supt. £800.
East African Medical Service.—M.O. £600.
Exeter, Royal Devon and Exeter Hospital.—H.P. £150.
Exminster, Devon Mental Hospital.—Third Asst. M.O. £300.
Federated Malay States, Central Mental Hospital.—Asst. Med. Supt. £616.
Finsbury Dispensary, Brewer-street, Goswell-road, E.C.—S. £50.
Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. £250.
Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W.—Radiologist. 50 guineas.
Inverness, Northern Infirmary.—H.S. £120.
Jamaica, Clarendon Parochial Board.—M.O.H. £600 to £800.
Leeds Public Dispensary.—Sen. Res. M.O. £200.
London Hospital, E.—First Asst. to each of the Surgical Firms. £400.
Manchester, Baguley Sanatorium.—Third Asst. M.O. £400.
Manchester, Monsall Fever Hospital.—Jun. Med. Asst. £405 6s.
Manchester, St. Mary's Hospitals for Women and Children.—Asst. M.O. £100.
Mid-Wales Counties Mental Hospital, Talgarth, Breconshire.—Med. Supt. £800.
Prince of Wales's General Hospital, N.—Asst. M.O. in Venereal Dept. £150.
Rotherham Hospital.—Sen. H.S. £260. Jun. H.S. £150.
Royal Free Hospital, Gray's Inn-road, W.C.—Sen. Res. M.O. £150.
Royal Naval Medical Service.—Surgeon-Lieutenants.
St. Helens County Borough.—Asst. M.O.H. £500.
Salvation Army Mothers' Hospital, Clapton.—Sen. Res. Med. Woman.
Swansea General and Eye Hospital.—Asst. Pathologist. £100.
West African Medical Service.—M.O. £660.
Windermere, Ethel Hedley Hospital for Crippled Children.—H.S. £150.
Wrexham Borough.—M.O.H. £700.

Births, Marriages, and Deaths.

BIRTHS.

NEWHAM.—On July 17th, to Marjorie (née Auden), M.R.C.S., L.R.C.P., wife of W. B. Turner Newham, A.R.I.B.A., of Waterkloof, Pretoria—*a son.*

DEATHS.

MAJOR.—On July 15th, at a nursing home in London, George William Major, M.D., of Montreal, Canada.

WHITE.—On July 18th, at 7, Cliff-terrace, Margate, Edward Alexander White, M.D., aged 70 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

TYPHUS FEVER EPIDEMIC AMONG THE GREEK REFUGEES.

BY SIR PATRICK HEHIR, K.C.I.E., C.B., C.M.G., M.D. BRUX., F.R.C.S., F.R.C.P. EDIN.,

MAJOR-GENERAL, I.M.S. (RET.); MEDICAL ADVISER, BRITISH RED CROSS SOCIETY IN GREECE.

(*Continued from p. 155.*)

The Municipal Hospital, Salonica.

THE remarks with which I terminated the first part of my article do not apply to all refugee typhus hospitals; some are decidedly superior. The best organised and worked infectious diseases hospital I have come across in Greece is that at Salonica under the local municipality. It is a hutted hospital arranged in groups of elongated wooden blocks well lighted and ventilated. It can accommodate 500 patients; it had under treatment on May 14th 149 cases. These included 86 typhus fever, 30 relapsing fever, 6 small-pox, 23 erysipelas, 2 enteric, 1 paratyphoid A, 1 scarlet fever. The staff consists of 3 medical officers, 15 nurses, and 23 male sick attendants. The whole work of the hospital, which deals exclusively with refugees, is of as high a standard as can be expected in connexion with the medical care of refugees. It was opened on Dec. 6th, 1922, and up to May 14th, 1923, had admitted 275 cases of typhus fever, of whom 16 died, a mortality of 5·8 per cent., the lowest on record in Greece. Of the staff 6 have been attacked, including the médecin en chef, 2 nurses, and 3 male sick attendants; all recovered. It is noteworthy that the infected nurses and sick attendants were employed in the delousing department of the hospital and not in the wards.

Period of Incubation.

Forty years or so ago 12 days used to be given as the period of incubation of typhus. All recent experience of the disease in Russia and Greece shows this to be still literally correct. It has been proved by the inoculation of infective human blood experimentally into man and monkeys.[1] It seems probable that the dose of the virus introduced into man initially may affect not only the severity of the disease but also the period of incubation. Medical officers in Greek hospitals treating typhus acquired by sick attendants, nurses, and doctors hold this view, and we have some grounds for supporting it from the cases treated in our own refugee typhus ward in Athens. Kusama has shown that if monkeys receive the minimum infective dose, the period of incubation will be lengthened and the fever will be of shorter duration and milder.

Clinical History.

Normally the onset is gradual. A generation or so ago a sudden and violent beginning was laid down as one of the specific features distinguishing typhus from typhoid. There are the usual indications of a commencing pyrexia, such as malaise, a tired feeling, headache, and anorexia. In a few days the face is somewhat flushed, conjunctiva injected, expression dull; tongue coated, lips and mouth dry; thirst, constipation, pain in the back and limbs are complained of; headache is severe. By the time the patient is brought to hospital (vide infra) there is, as a rule, no doubt about the diagnosis. By the fifth day the mucous membranes are often implicated in the rash, the tongue is thickly coated with a white fur and it becomes dry; later it is cracked and fissured; the mouth becomes offensive and sordes collect on the teeth, although these conditions can, to a certain extent, be prevented by careful nursing. Diarrhœa may set in at this time, and if intractable is an unfavourable symptom. On the other hand, as stated, constipation may be present and tempt the physician to administer aperients, the effects of which may be difficult to control.

The rash usually appears about the end of the fourth day, but at that time requires to be carefully looked for on the outside and front of the arms, on the chest, abdomen, shoulders, back, and hips. It comes out as small ovoid or round slightly raised pink or roseolar spots. On the fifth day the eruption is well marked, and among the red spots will be found some maculæ which do not fade on pressure. After this petechial patches may be formed. On the eighth or ninth day the eruption is decidedly petechial and has a multiform character—roseolar patches, red spots, maculæ or small petechiæ, and large plaques typically petechial. The eruption may vary, however, from faint pink roseolar spots to large ecchymosed patches. In a well-marked case by the sixth day the eruption cannot be mistaken for that of any other disease; it is well seen on the outer surface of the arms and forearms, shoulders, back and lower part of the abdomen, and on the hips. If the hands are affected the palms often escape, while the dorsal surface is covered with maculæ. In about 1 per cent. of the typhus cases seen in Greece there is either no eruption or only a faint roseolar one; this is more frequently the case in children and adolescents; in these the Weil-Felix reaction is present. By the end of the second week little is left of it. I was specially impressed by the absence of eruption on the face in cases where it almost covered the rest of the body. Nevertheless, there appeared to be a characteristic facies, with a reddish ring around the eyes about half an inch in diameter, and a similar but fainter ring round the mouth. These rings, with the injected conjunctiva, cracked lips and a dull, apathetic, semi-drunken expression, with much prostration, seemed to me to give the patient a very distinctive appearance. In some cases the general lousiness antecedent to the onset of the disease has led to considerable skin irritation with scratching and local secondary infections, which may initially be rather puzzling. In three large infectious diseases hospitals I visited several times the cases are as a rule admitted on the fifth day; the eruption is in the large majority of typhus cases already fairly developed.

Delirium.—Delirium, often noisy, is a common symptom about the end of the first week, but it soon acquires a low muttering character. Different phases of the mental state may be met with in a large ward of typhus cases. In a ward containing 30 patients which I visited one patient had just been retrieved after running out of hospital; another was attempting to run downstairs, two were shouting, in several there was a muttering delirium; some were dying, others were recovering consciousness, and so on. The whole picture was most melancholy.

Pulse and Temperature.—The pulse during the first week in uncomplicated cases runs from 85 to 100 per minute; it is losing tension. During the second week it is from 110 to 115. The comparatively slow pulse of 90 to 100 per minute with a high temperature is a normal phenomenon in moderately severe cases up to the beginning of the critical period, ninth to the fourteenth day, when it rises to 110 or even to 120–130. The temperature rises gradually, and by the end of the third day reaches 104° or 105° F. After reaching the maximum there is no great diurnal variation, the figure usually being a degree lower in the morning. The gradual rise is a useful guide to the diagnosis in the pre-eruptive stage, and differs from the regular "step-ladder" ascent of enteric. I came across several cases with temperatures between 103° and 106°, but none with real hyperpyrexia. A rapid fall of the temperature to the neighbourhood of 100°, in conjunction with the progressive rise in the pulse-rate, is an unfavourable sign. Increasing asthenia and muscular debility are always present; patients can scarcely move in bed; they are often unable to protrude the tongue, and lose all expression. Emaciation in some cases towards the end of the disease is most marked: to see a group of convalescents in most refugee typhus hospitals after moderately severe typhus, where proper feeding and massage have been neglected, reminds one of the cases of chronic starvation seen in famine camps in India. That it is not an inevitable consequence of the disease was seen in at least two hospitals, in one of which (Salonica) there was only one case of moderate emaciation among 32 convalescents. In a small proportion of cases there is a definite single crisis; in most cases there is lysis, but a mixture of these, beginning with a lysis and ending in a crisis, or the reverse, may take place. A true crisis is the most satisfactory termination, and leads to a fairly speedy convalescence; a definite and prolonged lysis is usually the forerunner of a long-continued convalescence.

In the above account of symptoms I have only given in general terms the ordinary course of moderately severe cases seen in the British Red Cross Hospitals and in Greek hospitals associated with our work. As with most other epidemic infectious diseases, cases vary considerably in severity. Some are so mild that the patients neither come to hospital nor take to their beds, and continue to move about as if nothing is the matter with them; the part such cases take in the epidemic need not be emphasised. Others brought to hospital at the end of the fifth day or later are so overwhelmed with the effects of the virus that they die in a day or to.

Diagnosis.

The general practitioner sometimes seems to find difficulty in accurately diagnosing some cases of typhus in the early stage. This is the experience of all the infectious diseases hospitals in Greece. I was informed by medical officers in charge of two large infectious diseases hospitals in and near the capital that about 8 per cent. of their cases are initially wrongly diagnosed, and that they continue to receive cases of influenza and relapsing fever, measles, and other diseases as typhus, while 3 per cent. of cases diagnosed as typhus turn out to be other diseases. Typhus is sometimes combined with other infectious diseases; I have seen three in which it ran concurrently with relapsing fever, proved by the coexistence of a typical typhus rash and *S. obermeieri* in the blood. Relapsing fever is the disease over which the greatest number of mistakes is made in all hospitals. In relapsing fever the *sudden* onset with rapid rise of temperature, severe headache, pains in the back and extremities, absence of dullness and apathy, and (ordinarily) of rash, the presence of a moist tongue, and of *S. obermeieri* in the blood, and, later in the disease, more or less anæmia, should be sufficiently distinctive. In the Salonica Hospital the records show that in eight cases typhus and relapsing fever ran their course concurrently in the same cases, and that so far as could be observed neither disease affected the course of the other; the only change noticed was that during a relapse the fever ran up a degree or so; nor did the cases assume a graver type, although the usual complications of typhus occurred. The use of neosalvarsan for the recurrent fever did not affect the normal progress of the typhus. The combined infection seems to suggest that the same louse may be able to carry *S. obermeieri* and the virus of typhus and inoculate them at the same time. This is a point worth investigation. In many typhus and influenza ran together, the latter disease being also epidemic at the time. In one infectious diseases hospital, where they admitted several hundred cases of both small-pox and typhus, the medical officers told me that they had not met a single instance in which the two diseases occurred in patients at the same time, although in one typhus followed the small-pox, probably from infection acquired in the hospital.

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[1] Kusama: THE LANCET, 1921, ii., 356.

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[1] The Causes of Heart Failure. By William Henry Robey, Assistant Professor of Medicine in Harvard University; Visiting Physician to the Boston City Hospital. Cambridge: Harvard University Press. London: Humphrey Milford, Oxford University Press. 1922. Pp. 45. 4s. 6d.

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SHOULD INFANT MORTALITY BE REDUCED?

Delivered before the Section of Maternity and Child Welfare of the Congress of the Sanitary Institute at Hull, August 2nd, 1923.

By FRED. E. WYNNE, M.B., B.Ch. Dub., D.P.H.,
MEDICAL OFFICER OF HEALTH, SHEFFIELD; PROFESSOR OF PUBLIC HEALTH, SHEFFIELD UNIVERSITY.

I am aware that to ask the question contained in my title will be regarded in some quarters as akin to blasphemy, but we have to face the fact that the question has been asked, will be asked again, and has been answered in the negative on very high authority. Those of us who are responsible for the saving of infant life and the prevention of infant suffering must, therefore, know what are the arguments brought against this work. The unparalleled fall in infant mortality during the last 20 years must be attributed very largely to improved sanitation generally, and especially to the intensive campaign of baby culture carried out by child welfare organisations throughout the country; as we have claimed the credit, so we must accept the responsibility for this state of affairs.

Speaking very briefly and generally, the objections to this reduction of mortality are two, viz.: (1) that it is interfering with the proper balance of births and deaths, and by increasing the rate of natural increase is adding to the difficulties of a nation already overpopulated; (2) that infant mortality is selective in its action, and that its reduction involves an undue survival of hereditary undesirables, thereby progressively deteriorating the race.

The Limits of Population.

To take the first and simpler argument first, there must obviously be a limit to population, and as population increases the rate of increase must be reduced; otherwise the annual increment would in time reach intolerable proportions. We have in parts of China and India and other eastern countries instances of communities which have reached and passed the limit of population, where whole races live in a condition bordering on starvation, and infanticide is the recognised practice, until famine and flood cut short the sufferings of the human swarm. Among these people the instinct of race preservation absolutely demands female infanticide, and it is interesting to note that, as always happens, this instinct is interpreted in terms of religion. The Chinaman must have a son, otherwise not only his own soul but those of his whole line of ancestors are condemned to eternal perdition. He therefore kills off female infants in order to make room for the hoped-for male. Until that son is born he will go on begetting children.

We are still far from these horrors which are inevitable when population overtakes the limits of the means of subsistence; but even in this country we have reached one of those crises foreseen by Malthus, when, in spite of all our industrial development and consequent power of importing food, our population question is already becoming acute; when it is at least rendering impossible the improved standard of living now universally demanded; and when, as many believe, the pressure of population is the real cause of all our social troubles, including war. This danger would be so real as to constitute a serious argument against a further reduction of the death-rate were it not that it is largely counterbalanced by a decline in the birth-rate.

The average birth-rate in England and Wales in the 10 years 1871 to 1880 was 35·4, and in the five years 1911 to 1915 it was 23·6. During the same periods the general death-rate was 21·4 and 14·3, while the infant mortality rate fell from 149 to 110. In 1922 the birth-rate in England and Wales was 20·6, the general death-rate 12·9, and the infant mortality rate 77. This fall in the birth-rate, however, is not yet sufficient wholly to compensate the two factors of lowered death-rate and increased population, so that the actual increment is as yet no less year by year. In fact the survival rate in England and Wales actually increased from 12 in 1910 to 13 in 1920. This has not, however, been our experience in Sheffield, where the infant mortality has fallen from 202 in 1901 to 82 in 1922. Notwithstanding this, the actual excess of births over deaths has fallen from 6874 in 1902 to 4707 in 1922, a decrease in natural increase of 2167, or 32 per cent. This is consequent on a decline in the birth-rate during the same period from 33·3 to 20·7, which has not been fully compensated by a decline in the general death-rate from 16·9 to 11·7.

We therefore feel that as far as the population question is concerned in Sheffield we can continue our child welfare work with an easy conscience. The law which correlates birth-rates and death-rates, though very imperfectly understood, is so universal and so well known that there is no need to quote examples of it. It seems always, however, to be assumed that the lowered death-rate is consequent on the decreased birth-rate. No doubt this is to some extent true. The mother of a few children is not physically exhausted like the mother of 12, and the individuals composing a small family naturally come in for a larger share of parental solicitude than the members of a large one. But although it cannot be proved in figures I am convinced that the reverse is also true, that when children are born and allowed to die off like flies, there will always be a tendency to the reckless begetting of more; whereas when children are born into an environment in which they can survive, their influence makes for an increased sense of parental responsibility in both father and mother and a consequent restraint which must have a marked influence on the birth-rate.

Survival of Undesirables.

We must now consider the second and more serious charge, that by preserving the lives of the hereditary degenerate and unfit we are causing a deterioration of the mental and physical standard of the race. If I could be convinced of this, I should unhesitatingly advise the closure of every child welfare centre in the country, for I hold that we have no right to allow public health policy to be dictated by our natural feelings of human sympathy for the individual. Really to permit or encourage any process that would lead to a marked degeneration of the race would, in the long run, lead to suffering on a far vaster scale even than that which we now attempt to alleviate. I have accordingly felt it necessary to examine rather closely the evidence on which these charges are based.

Prof. Karl Pearson and others of his school have been at great pains to produce mathematical demonstrations of the fact that longevity is an hereditary and transmissible quality. In this they have fully succeeded, though I do not suppose the fact was ever in dispute. But they proceed to certain deductions based on a somewhat elaborate calculus which is applied to data of admittedly doubtful accuracy. The first of these conclusions is, according to Prof. Raymond Pearl,[1] "that from 50 to 75 per cent. of the general death-rate of the population on which the calculations are based is determined fundamentally by factors of heredity and is not capable of essential modification or amelioration by any sort of environmental action, however well intentioned, however costly, or however well advertised." If this be so, it is simply amazing that death-rates have responded as they have done to environmental changes, for it cannot be suggested that any hereditary factors have been at work to reduce the death-rate from 21 to 12 in 50 years. I am reminded of Bishop Butler's comment on the doctrine of necessity or determinism: "this doctrine, if true, is as though it were not true." A necessary corollary of this theory is that the death-rate, and more especially, of course, the infant death-rate, is selective in its other infectious diseases; I have seen three in which it ran concurrently with relapsing fever, proved by the coexistence of a typical typhus rash and *S. obermeieri* in the blood. Relapsing fever is the disease over which the greatest number of mistakes is made in all hospitals. In relapsing fever the *sudden* onset with rapid rise of temperature, severe headache, pains in the back and extremities, absence of dullness and apathy, and (ordinarily) of rash, the presence of a moist tongue, and of *S. obermeieri* in the blood, and, later in the disease, more or less anæmia, should be sufficiently distinctive. In the Salonica Hospital the records show that in eight cases typhus and relapsing fever ran their course concurrently in the same cases, and that so far as could be observed neither disease affected the course of the other; the only change noticed was that during a relapse the fever ran up a degree or so; nor did the cases assume a graver type, although the usual complications of typhus occurred. The use of neosalvarsan for the recurrent fever did not affect the normal progress of the typhus. The combined infection seems to suggest that the same louse may be able to carry *S. obermeieri* and the virus of typhus and inoculate them at the same time. This is a point worth investigation. In many typhus and influenza ran together, the latter disease being also epidemic at the time. In one infectious diseases hospital, where they admitted several hundred cases of both small-pox and typhus, the medical officers told me that they had not met a single instance in which the two diseases occurred in patients at the same time, although in one typhus followed the small-pox, probably from infection acquired in the hospital.

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[1] Biology of Death, Prof. Raymond Pearl. Lippincott, 1922.

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From this it will be seen that the percentage of the total mortality due to congenital causes has increased from 39 to 45; the percentage due to respiratory disease has increased from 13 to 27, while that due to diarrhœal diseases has fallen from 27 to 7. It is quite evident from these figures, and the greatly reduced birth-rate already referred to, that the reduction of the Sheffield infant mortality is mainly due not to the saving of the congenitally unfit, but to the virtual elimination of infantile diarrhœa, which has comparatively little to do with congenital conditions.

The next point to be considered is how far the negative correlation between infant mortality and child mortality shown by Snow's figures exists in Sheffield? Table III. shows the infant mortality rate, the mortality rate per 1000 births in the age period 1 to 5, and the general death-rate for various years between 1897 and 1922.

TABLE III.—*Infant Mortality Rate (City of Sheffield); Mortality Rate per 1000 Births amongst Children over 1 and under 5 years of age; and General Death-rate.*

Year.	Infant mortality rate.	Mortality rate per 1000 births ages 1–5 years.	General death-rate.
1897	196	94	21·2
1902	150	62	16·9
1907	145	87	17·1
1912	107	60	14·3
1917	104	61	14·6
1921	99	41	12·5
1922	82 = 41·9 %	44 = 46·8 %	11·7 = 55·2 %

From this it will be seen that while the infant mortality rate in 1922 is only 41·9 per cent. of the rate in 1897, the death-rate from 1 to 5 (calculated per 1000 births) has also fallen to 46·8 per cent. of what it was. These considerations appear to me to go far to justify our work as far as Sheffield is concerned, but I realise that the figures quoted are too small to serve as a basis for general statistical conclusions. My hope is that the problem may be attacked on somewhat similar lines by persons better fitted than myself to deal statistically with more extensive data.

At the same time I am entirely in agreement with the eugenic school that the heredity of all children coming under our care should as far as possible be studied. It is not practicable to refuse aid and comfort to the innocent victims of caro-genic unions, but it should be an essential part of child welfare work to seek for means of preventing such unions. I am also convinced of the seriousness of the population problem, of what Prof. Pearl has well described as "the impending saturation with human population of the portion of the earth's surface habitable by man."

But for the reasons given above I think it not impossible that a reduced rate of infant mortality may itself prove a factor in bringing about a desirable reduction in the birth-rate. I am convinced that in any case it is time that the thoughtless sentimental propaganda in favour of the unlimited production of babies, and their preservation whether fit or unfit to survive, should be sternly discouraged by all who take public health work seriously.

ROTARIAN PHARMACISTS.—A meeting of Rotarian pharmacists was held at the Hotel Great Central, London, on July 25th, Dr. Thomas Stephenson, of Edinburgh, in the chair, and the meeting was representative of all parts of the country. The chairman opened a brief discussion on Rotarianism as applied to pharmacy, pointing out the necessity of the promotion of friendly relations between the allied professions of medicine, dentistry, veterinary surgery, and chemistry. He further pointed out that the governing principle of Rotary—namely, service to the community—should be the basis of all work in pharmacy; if this principle were applied to many controversial questions it would be found that these questions were capable of easy solution.

VASOSTOMY FOR SEMINAL VESICULITIS,[1]

WITH A DESCRIPTION OF A NEW AND IMPROVED TECHNIQUE FOR THE OPERATION.

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FOR many years it has been realised by those who are called upon to deal with a large number of cases of gonococcal urethritis occurring in the male that there is a certain type of case which will baffle all the ordinary methods of treatment. The majority of cases of chronic gonorrhœa in the male get well in the course of from four to six months' treatment if irrigations or instillations accompanied by prostatic massage are employed. Many cases also need dilatation of soft strictures with bougies and Kollmann's dilators, and some require urethroscopic destruction of infected follicles in the anterior urethra. In any large series of consecutive cases 99 out of every 100 can be cured in a reasonable time by such treatment. There will remain uncured a type of case which I call a "bugbear" case, and which may be described as follows. The history will be that the man has had constant relapsing attacks of gonococcal urethritis over several years. These attacks come on the day after going with a woman. Often adequate precautions have been taken against infection, yet urethritis at once occurs. Or the attacks may come on apparently spontaneously after an excessive drinking bout or after hunting or bicycling. The man often knows that he has not been really cured, and that he harbours lurking gonococci shut up somewhere or other. Between the attacks, when he appears to be free of urethritis, he may suffer from attacks of increased frequency of micturition accompanied by hazy urine and pain or discomfort felt in the perineum or beneath the last inch of the penis, or even in the abdomen, loins, or thighs. These attacks may be attended by fever and be ushered in with a rigor. Some of these patients develop a swelling of one epididymis every time they get an attack, a swelling which comes on at the same time as the urethral discharge, a feature which distinguishes the illness from an ordinary case of reinfection. A few of them complain of hæmaturia, usually a few drops of blood squeezed out at the end of micturition. Others complain of hæmatospermia, or in other words they notice after a nocturnal emission that their pyjamas are stained with blood. Many of these men suffer from severe neurasthenia, often accompanied by impotence or sterility.

Features Associated with Stubborn Cases.

On examination it is found that in the majority of such cases the urine passed is not clear, but shows a dull thin haze of pus of a peculiar and characteristic appearance diagnostic to the trained eye of vesiculitis. But the feature above all others which characterises these "bugbear" or stubborn relapsing cases is that examination of the rectum reveals a prominent, thickened, tender, swollen seminal vesicle on one or both sides. If the testicle has been swollen on one side, the swollen vesicle will usually be on the same side. Attempts to massage the vesicle with the prostate simply lead to the obtaining of a bead of prostatic fluid which is only mildly purulent. If both vesicles are blocked no spermatozoa and no large mucinous shadows characteristic of vesicular secretion will be seen under the microscope. After the massage the vesicle or vesicles feel just as full as before. In other words, the contents of the vesicle are shut off from the deep urethra, the mouth of the duct being blocked with inspissated secretion or by fibrous stricture. It is in such a closed vesicle that the gonococcus (or the colon bacillus or streptococcus) can live imprisoned for years, and from time to time spring to life under the influence of alcohol or excessive action. Here, indeed, is the gravamen of the charge, for if this be so to the extent claimed, by trying to lessen infant mortality we are simply placing ourselves in the position of one who should cease weeding his garden and allow all his best plants to be choked by weeds. This view is developed especially by Dr. E. C. Snow in his "Studies in National Deterioration."[2]

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[1] A paper read at the annual general meeting of the Medical Society for the Study of Venereal Diseases, July 20th, 1923.

The statistical studies in the heredity of longevity had been based on data obtained from the records of Royal families, from Burke's Peerage and Landed Gentry, and from the history of Quaker families, obviously exceptional sections of the population. Snow set himself the far more difficult task of applying similar statistical methods to the general population, for which purpose he took as his data the populations of English and Prussian rural districts. He found a high degree of negative correlation between the death-rate in the first year of life and that in later periods up to 8 years.

On these results Snow bases the following conclusions: "We assert with great confidence that a high mortality in infancy is followed by a corresponding low mortality in childhood, and conversely. The migratory tendencies in urban districts militate against the deletion of selective influences there, but we express the belief that those influences are just as prevalent in industrial as in rural communities, and could be measured by other means if the data were forthcoming. Our work has led us to the conclusion that infant mortality does effect a weeding out of the unfit; but though we would give this conclusion all due emphasis we do not wish to assert that any effort, however small, to the end of reducing this mortality is undesirable."

Personally I find some difficulty in understanding why the data acquired by Snow cannot be obtained as well for urban and industrial populations as for rural ones, and if I shared his conviction I should certainly say that efforts to encourage these weeds were most undesirable. Quite apart from the findings of mathematicians I presume no one would deny that infant mortality is to a great extent selective, and especially so where the environment is undesirable. Congenitally weak babies, of course, are more likely to die from any given cause than strong ones. To my mind the whole question hinges on this: by reducing infant mortality are we merely postponing the deaths of weakly infants, thereby prolonging their sufferings and increasing the burden of those responsible for them, or are we doing something to provide an environment in which potentially good citizens have a reasonable chance of surviving and reproducing?

Sheffield Child Welfare Figures.

In order to answer this question as far as Sheffield is concerned, I have examined the records of 100 deaths of infants who had been under the care of our child welfare centre, and of whose home conditions and heredity we accordingly had some knowledge. These were all deaths occurring in the same year, but were otherwise taken quite at random, and are therefore typical of infant mortality as it affects our city. Of these deaths I have taken three groups as having probably different correlations with hereditary and environmental conditions. The groups are: (1) prematurity, convulsions, marasmus, &c., which are presumably closely dependent on heredity; (2) respiratory diseases, which I should expect to have the lowest correlation with either heredity or unsatisfactory environment; and (3) diarrhœal diseases, in which I should expect the correlation to be intermediate between the other two.

Of these 100 deaths I find that 23 are due to prematurity and definitely congenital conditions; 39 to respiratory diseases, and 24 to diarrhœal diseases, the balance of 14 being due to other causes. In order to test whether my preconceived ideas as to the probable correlation of deaths from these causes with hereditary and environmental conditions was correct, I have taken the employment of the father and the home conditions as indices of heredity and environment. As everyone knows, there are, unfortunately, immense numbers of men at present out of work through no fault of their own, especially in Sheffield, but it seems a reasonable assumption that any man who has continued in skilled employment during such times as the present must be of a superior and intelligent type.

I have therefore divided the deaths between two classes as regards heredity—children of men in skilled employment and those of men out of work, engaged in relief work or unskilled labour. As regards environment I have made three classes according to the description of the home conditions—as good, fair, or slum. Table I. gives the percentages of deaths in each of these classes:—

TABLE I.

	Percentages.				
	Father.		Home conditions.		
	Class 1.	Class 2.	Good.	Fair.	Slum.
Congenital causes (23 deaths)	52·2	47·9	26·1	34·7	39·0
Respiratory diseases (39 deaths)	71·8	28·2	27·8	50·4	21·8
Diarrhœal diseases (24 deaths)	58·5	41·5	29·0	58·0	13·0

It will be seen that the presumed correlation works out fairly closely, the percentage of second-class parentage among children dying of congenital causes being very much greater than in children dying of respiratory disease, and considerably greater than in children dying of diarrhœal diseases. The percentage of slum conditions is also much greater among the congenital deaths, doubtless because slum conditions are very largely an index of parental degeneracy. The percentage of slum conditions among infants dying of diarrhœal diseases is surprisingly low, but this is accounted for by the fact that breast-feeding in Sheffield is the rule among the poorest classes, and the incidence of diarrhœa is therefore slightly higher in the class just above the lowest. The figures are, of course, small, but as far as they go I think the results show a definite correlation as expected between heredity, environment, and deaths from these three groups of diseases.

The next step in my inquiry was to compare the mortality from these three groups of diseases in a year of very high mortality, when infant welfare work had scarcely begun, with a year of very low mortality, when this work had been very highly organised for a considerable period. Table II. gives this comparison for the years 1901 and 1922.

TABLE II.—*Infantile Mortality (City of Sheffield) from all Causes and from Specified Causes grouped. Years 1901 and 1922.*

—	1901.		1922.		Percentage fall in mortality rate.
	No. of deaths.	Mortality per 1000 births.	No. of deaths.	Mortality per 1000 births.	
Prematurity ..	300	79 (39 %)	226	37 (45 %)	53
Debility Marasmus	335		88		
Congenital malformations	83		39		
Convulsions ..	292		50		
	1010		403		
Diarrhœal diseases	706	55 (27 %)	65	6 (7 %)	89
Pneumonia ..	160	26 (13 %)	114	22 (27 %)	15
Bronchitis ..	169		119		
	329		233		
All causes ..	2573	202*	884	82	59

* The infantile mortality rate for 1901 (202) was the highest recorded since the year 1871.

Note.—The first woman inspector was appointed in 1899.

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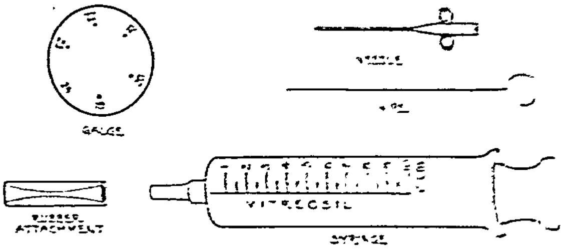
[2] Drapers' Company Research Mem., vii., 1911.

that the vas must be stripped quite bare of all connective tissue before opening it, and take care not to cut the artery to the vas which runs along its posterior wall. With a fine sharp-pointed tenotome make a tiny incision into the lumen of the vas large enough to admit a hollow hypodermic needle. Having opened into its lumen insert a piece of silkworm gut and run it down for some 10 inches to make certain that the lumen has been entered freely and that the vas itself is not blocked. Remove the silkworm gut, remove the knife handle, and sling up the vas with a piece of boiled tape. Insert a special cannula[3] (see Fig. 1) gauge 19–23 according to the size of the vas. It is of the utmost importance not to use too large a cannula. If too large a cannula is inserted it will strip up the lining membrane of the vas and stultify the operation. On to the nose of the cannula fit a special rubber tip as designed and used for renal lavage (described by me in 1922[4]), and to this attach a vitreosil syringe containing a few c.cm. of sterilised warm water. Using counter pressure with the tape, gently press the piston of the syringe till the water is found to run easily into the vas. Now pack a little gauze beneath the vas to prevent colloid silver from falling on to the tissues. For some reason or other colloid silver causes no irritation to mucous membranes, but it causes great irritation and inflammation if allowed to fall on to or leak into connective tissue. Fill the syringe with 10 c.cm. of 5 per cent. colloid silver. Reattach it to the rubber nozzle, and, using counter pressure with the tape under the vas, gently press home the piston. The colloid silver will be found gradually to disappear into the vas and enter the vesicle. If 10 c.cm. are taken quite easily squirt in another 10 c.cm., and if this is taken easily even another 10 c.cm., till 30 c.cm. are taken. The larger the quantity of fluid used up to 30 c.cm. the better, if the vesicle is found willing to take it. If not, be content with 10 or 20 c.cm.

FIG. 1.

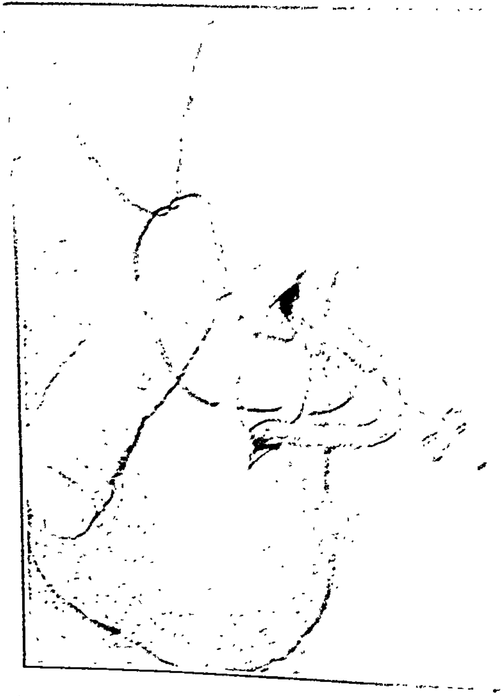


Syringe, attachment, gauge, needle, and wire.

Remove the syringe and rubber cap and insert a wire down the cannula to keep it from getting blocked. Now comes the most important step in the operation. Insert a fine silkworm gut suture mattress-wise right through both sides of the skin and fascial incision and beneath the vas. Return it and pass it back again half an inch below through both layers of the skin and fascia likewise beneath the vas (see Fig. 2). Tie this suture, and thereby leave the vas slung up on a bed of connective tissue securely anchored at the level of the skin. Now fix each of the two rings provided on the cannula by means of a fine silkworm gut suture to the skin on each side. You now have the vas neatly slung up just beneath the skin and a cannula securely fitted in place ready for the next wash-out. I spray the little wound with a few drops of my malachite-green ethyl chloride spray to prevent wound sepsis and cover it with a sling of gauze which slings up also the testicles, cover with a T-bandage, and thread a piece of mackintosh over the penis to prevent soiling with urine. *The patient's legs are bandaged together till he has come round from the anæsthetic. If both vesicles need lavage the operation is repeated on the opposite side. Sometimes the colloid silver is passed in the next few acts of micturition; sometimes it is not passed for several days. Belfield has record of a case where it was retained as long as 51 days without coming through. Sometimes it is passed as a black nocturnal emission a few days after the operation. In any case the vesicle can be felt by rectal examination to be distended with the wash, and its presence in the vesicle can be demonstrated by radiograms.*

On the second day the wire guide is removed from the cannula, the syringe and rubber nozzle refitted, and a few drops of sterile water injected. If the injection runs freely 10 c.cm. of colloid silver, 5 per cent., is then injected slowly. If the cannula is blocked and cannot be unblocked by means of the wire guide or the injection of water, do not force colloid [illegible] the cannula. If you do so it will only pass [illegible] into the tissues and cause a painful reaction [illegible].

FIG. 2.



Showing vas with cannula inserted and mattress suture passed and about to be tied so as to sling up vas just below the level of the skin surface.

In case of failure to get a *second wash through*, desist and take out the cannula. *Usually a second* wash goes through quite satisfactorily, *the wire guide is* reinserted, and a third wash is given *on the fourth or* fifth day, after which the cannula is *removed. When removing the cannula take out the silkworm gut slinging stitch and with the fingers manipulate the wound so as to loosen the adhesions round the vas and make it drop back into its proper position deeply in the scrotum.* This is a most important step. Unless this is done the vas may remain adherent to the skin wound and the opening persist as a spermatic fistula.

Results Obtained.

I shall now detail the results I have been able to obtain in 25 consecutive cases of vasostomy and the lessons I have learnt from them. Hitherto I have reserved the operation solely for "bugbear" cases, so that I have not had many cases for which the operation was necessary. I shall hope to obtain an increasing number of cases if I can persuade the profession that the operation is well worth while for fresh acute cases of vesiculitis with arthritis. I have notes of 25 cases venery or after a blow on the perineum. It then sets up an abscess which bursts into the deep urethra through a fortuitous opening which the pus digests for itself, and so leads to relapsing attacks of urethritis.

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[3] These cannulæ are specially made for me by J. H. Montague, of 69, New Bond-street, and also the gauge for measuring their sizes. They are constructed so that a guide wire will pass easily either way, in contrast to the usual hypodermic needle where a wire will only pass one way owing to the method of construction. This is a very important point. They can also supply the syringe and special rubber nozzles (see Fig. 1). Colloid silver in strengths of 5 and 10 per cent. is specially made for me by Crookes Collosols, 22, Chenies-street, London, W.C.

[4] Brit. Med. Jour., 1922, i., 748.

In exceptional cases most of these features are absent. The man lives for years happily married without a suspicion that anything is amiss, his wife remaining free from infection. His urine is clear and he has no symptoms. Suddenly one day after a drinking bout he develops an arthritis or an iritis, and a few days or even a few weeks later profuse yellow urethral discharge makes it appearance, containing abundant gonococci. In these cases can always be felt by rectal examination a large, hard, thickened seminal vesicle from which pus and gonococci can be expressed by massage. In the case of one doctor I have evidence that the gonococcus had lived thus imprisoned for 25 years. In another doctor it had lived for 13 years. In another case it had thus lived for 44 years and set up attacks of arthritis and iritis. In other words, when faced with a case of unexplained arthritis or iritis, do not rest content until you can exclude the possibility of a closed infected vesicle. Also, in cases of chronic relapsing fever you may find the cause in a closed vesicle infected with the colon bacillus. Case 7 had been treated for fever in the tropics for nine years without any success until I proved he had a chronic infection of one vesicle with the colon bacillus and cured him by vasostomy. There were two other similar cases in this series.

In the ordinary case of posterior urethritis, with or without epididymitis, one or both vesicles usually become infected. These react to, and recover under, prostatic (and vesicular) massage because the duct is not blocked and because massage gradually brings away purulent infected vesicular secretion, often in the form of purulent casts of the vesicle.

It became clear, then, that there were certain "bugbear" cases of chronic relapsing gonorrhœa (and also of chronic relapsing colon bacillus or streptococcus infection) which could not be cured by any measures which did not get at the closed focus in the vesicle and eradicate it. Fuller and his pupils in America taught that in these cases an incision should be made in the perineum, through which the vesicles should either be drained or else completely removed. This operation can be carried out by the technique devised and improved by Fuller, Alexander, Young, and others, but it is an operation of considerable technical difficulty. Unless an operator can obtain a long apprenticeship in this operation he is bound to have a number of unpleasant complications, such as urinary and recto-urethral fistula and urinary incontinence. It occurred to other urologists to try and catheterise the ejaculatory ducts through a posterior urethroscope and so wash out the vesicles. This has undoubtedly been effected in a certain number of cases, notably by Luys and Hugh Young. Nevertheless it is not possible to catheterise these ducts except in a few cases. In most cases failure is met with. In not a few the cannula is pushed into the perivesical tissues, abscesses are produced, and other unpleasant consequences follow. The procedure is also very painful for the patient.

Belfield's Operation.

It occurred to Belfield, of Chicago, to try and get at the vesicles from the other end. He published his first paper in 1905,[2] and since then has published many papers dealing with the subject. He proposed to cut down on the vas deferens in the groin or scrotum, free it, puncture it with a hollow needle, and inject medicating fluid into the vas, ampulla, and vesicle. Using silver salts he showed by X ray photographs that by such a procedure it was possible to fill the ampulla of the vas and also the vesicle completely with antiseptic fluid. He pointed out that the vesicle is really a simple sac, lined by a few layers of columnar epithelium. That it possesses no lacunæ or cryptic recesses such as characterise the anterior urethra. That the fibrous bands which break up its internal lumen are simple structures which seldom interfere in any way with the complete filling of the vesicle with fluid. The fluid when injected into the vas meets with the sphincter muscle which surrounds the mouth of the ejaculatory duct. It then regurgitates backwards up into the lumen of the vesicle and fills it completely. If, as is often the case in stubborn cases, the vesicle is filled with a cast of inspissated secretion, collargol or colloid silver softens and disintegrates this cast, and enables it thereby to be passed out of the vesicle during the course of a nocturnal emission. To Belfield belongs, then, the great credit of having established a new and effective principle in the treatment of these "bugbear" cases, and in the course of years he has improved the technique and enlarged the scope for the operation. I would point out what a deep debt urologists owe to Belfield for originating this new and vital principle. Not only does Belfield employ the operation for chronic resistant cases, but he now makes use of it in cases of recent acute vesiculitis accompanied by arthritis with marked success. Nevertheless I find that even with his improved technique the operation is not always an easy one, nor is it always possible to make sure of giving three wash-outs in the course of a week. As I hope to show, unless one can ensure three wash-outs in a week, one cannot hope to cure more than 80 per cent. of cases. For that reason I have worked at improving the technique, and I now describe a new type of operation whereby it is nearly always possible to obtain successful results. This is the object of my communication to-night. The operation is not easy, and I warn those who embark on it to read very carefully the minute details of technique described below.

The Improved Operation.

I shall first describe very briefly the history of the operation of vasostomy. Belfield tried cutting on the vas and washing out from above (vaso-puncture). He soon found that more than one wash was needed to effect unfailing cures, at the most two or three. He therefore tried slinging up the vas with a strip of rubber sheeting, dropping it back into the wound and fishing it up again every other day and re-puncturing it. This is the technique originally demonstrated to me at the London Hospital in 1914 by his pupil, Dr. R. H. Herbst of Chicago, and which I employed for some years. The rubber may cause sloughing of the vas, so I gave it up. I next tried his improved method. In this, after exposing the vas, he punctures it with a No. 23 gauge hollow needle, runs the needle along the canal for an inch, and then brings it out through vas and skin. He threads a strand of silkworm gut through the needle, removes the needle, and so has the vas slung to the skin with a strand of gut. He uses this strand as a guide for inserting the needle. I found that the solution used for lavage leaked around the puncture and irritated the tissues, so I gave this method up. Gradually and step by step I devised my present technique which I now describe, and it is as near perfect as I can at present make it. Nevertheless difficulties may still arise, and it is not easy to ensure that three washes shall be given in the course of six or seven days.

Technique.

The parts are shaved and the skin is disinfected with iodine. The operation can be done under local anæsthesia; nevertheless I usually employ a general anæsthetic (open ether), as I prefer to keep the patient in bed for five or six days. Pinch up the skin at the top of the scrotum on its outer side where the dartos muscle is absent, isolate the vas from the other structures of the cord, and hold it firmly in position with the fingers of the left hand immediately under the skin. Make an incision one inch long directly down to the vas till its white wall is clearly visible. Seize the vas with a pair of tenaculum gland forceps, and with a few strokes of the knife, free it from its loose outer coating of areolar tissue, until the handle of a scalpel can be pushed beneath it. The vas now lies spread out and stretched upon the handle of the knife. Note

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[2] Jour. of the Amer. Med. Assoc., April 2nd, 1905.

CASE 4.—March 17th, 1916; gonorrhœa 16 years, iritis, joints, both vesicles enlarged, left orchitis. On the 31st vasostomy, right side satisfactory, three washes, left vas blocked entirely, no fluid would go through. June 27th, still had iritis and the left vesicle was not cured.

CASE 5.—In 1918; three years' gonorrhœa, left orchitis, joints. Left vasostomy, three washes. Proved cured in three weeks, joints cleared up entirely.

CASE 6.—On Jan. 29th, 1920; six years' gonorrhœa, right orchitis, right vesicle enlarged. Treated by ordinary methods until Dec. 10th without effect. On the 22nd right vasostomy, one wash only. March 11th, 1921, proved cured.

CASE 7.—Oct. 12th, 1920; since 1911 had attacks of fever, increased frequency, pain in the perineum, called "malaria." Married two and a half months, two days fever and hæmaturia, right vesicle enormously enlarged, contained *B. coli* and staphylococcus. On the 17th right vasostomy, three washes. Complete black cast of vesicle passed after the third injection. On Nov. 8th urine clear, prostatic and vesicular fluid normal, no pus. Heard from later, has had no further trouble.

CASE 8.—On Nov. 10th, 1920; gonorrhœa eight months, right orchitis, right vesiculitis. Seen again March 2nd, 1921, when he had had three months more treatment, still right vesiculitis. On the 11th double vasostomy, one wash to each vesicle. On April 11th passed complete marriage tests; got married and had no trouble.

CASE 9.—July 14th, 1922; gonorrhœa two years, marriage in prospect. Urine clear, left vesicle immensely enlarged. August 8th, left vasostomy, three washes. On the 24th proved cured. Nov. 21st, again tested for marriage, and proved cured. Got married and had no trouble.

CASE 10.—Married, strange connexion November, 1920, not with wife since. Has had long treatment with failure to cure. Both vesicles enlarged. July 21st, 1920, double vasostomy, left side one wash, right side two washes. August 4th, 1921, proved cured and returned to wife, no trouble.

CASE 11.—July 25th, 1921; had had three years' treatment for infection of right vesicle with *B. coli* and streptococcus. Gets increased frequency, fever, and hazy urine. On the 28th double vasostomy, right two washes, left one wash. August 8th, urine clear, no increased frequency, prostatic fluid normal, vesicles normal. Had no further trouble.

CASE 12.—April 15th, 1921; for some years had had aching in left loin accompanied by fever. In February contracted gonorrhœa and had *treatment from* April to October without result. On Oct. 10th double vasostomy, two washes to each vesicle; this cured the vesicles. On the 31st left renal lavage, staphylococcal pyelitis. Pyelogram—double kidney, one ureter. Right kidney tested, found to be sterile. This cured the renal infection. In November urethral discharge reappeared containing gonococci. This was traced to a suburethral abscess in the perineum, excised Dec. 1st. This cured him. Writes December, 1922, to say he has had no further trouble whatever.

CASE 13.—Oct. 7th, 1921; 13 years ago had gonorrhœa for some months, then no trouble. Married three years ago, *wife has had* no trouble. Two weeks ago after drinking many cocktails great difficulty in micturition, rigor. Came up at once to be examined. Enormous swelling of right vesicle, water clear, no stricture. Massage of the vesicle produced pus and gonococci. On the 25th right vasostomy, three washes. Nov. 14th, passed marriage tests, proved cured and returned to wife. Since then no further trouble.

CASE 14.—March 21st, 1922; gonorrhœa nine months, treatment three months ago. Joints, left vesicle much enlarged. March 29th, 1922, left vasostomy, one wash. April 8th, passed marriage tests and proved cured. Got married, no trouble.

CASE 15.—Nov. 6th, 1922; gonorrhœa since 1918. Marriage in prospect. Has had arthritis, fever, wasting, hazy urine, both vesicles much enlarged. On the 13th double vasostomy, two washes. On the 24th appeared cured, had three marriage tests and got married; no trouble.

CASE 16.—Jan. 18th, 1921; six years' gonorrhœa, urine hazy, both vesicles much enlarged. On the 21st double vasostomy, two washes. Feb. 8th, urine clear, prostatic fluid absolutely healthy; on the 23rd had passed three marriage tests, no further trouble.

CASE 17.—May 25th, 1920; married, living in Tropics, wife at home. Developed gonorrhœa December, 1919, arthritis, vesiculitis. Treated by ordinary methods up to Nov. 10th, 1920, when gonococci were still found in profusion. Right vesicle much enlarged. On the 17th right vasostomy, two washes. By Dec. 19th had passed three marriage tests, went back to his wife and had no trouble.

CASE 18.—Jan. 31st, 1921; gonorrhœa since October, 1913. Urine hazy, right vesicle enormously enlarged, fluid expressed full of pus and gonococci. Severe neurasthenia, fears gonococcal infection of kidneys. April 7th, 1921, both ureters catheterised, urine from each kidney contained staphylococci but no gonococci. Kidneys washed out on several occasions, and by May 20th proved to be free of infection. Double vasostomy, three washes. The urine remained black for five days after the last wash. June 23rd, urine clear, no albumin, prostatic fluid absolutely healthy. Proved cured.

CASE 19.—Feb. 19th, 1920; since August, 1914, has had continual attacks of fever, increased frequency, pain in perineum, hæmatospermia. Right vesicle immensely enlarged and contained pus and *B. coli*. Prostatic massage relieved for a time, but in December, 1922, sharp relapse with high fever. On the 6th, right epididymectomy, needle stitched into right vas, left vasostomy. Three washes to each side. Since April, 1923, urine clear, prostatic fluid healthy, has had no more trouble.

CASE 20.—Jan. 23rd, 1920; for three years latent relapsing gonorrhœa which appeared to get well and then burst forth again. Urine hazy and right vesicle enlarged and containing pus and gonococci. Relapses Nov. 11th, 1920, August 2nd, 1922, and Dec. 14th, 1922. Persuaded to undergo vasostomy as marriage was in prospect. Jan. 8th, 1923, double vasostomy, three washes left side, two washes right side. By March 9th, 1923, had passed all marriage tests, and was proved cured. Got married, no further trouble.

CASE 21.—Jan. 14th, 1915; had gonorrhœa for two years, with three relapses. All the usual treatment had no effect, the right vesicle being much enlarged. On June 28th right vasostomy, four washes given. Seen August 4th, no treatment for one month, taken alcohol freely, urine clear, prostatic fluid absolutely healthy, cured. Seen again April 2nd, 1916; had had no further trouble.

CASE 22.—Oct. 9th, 1915; married ten years. Recently developed gonorrhœal right knee, left wrist acute synovitis, has had five injections of vaccine, joints still as bad as ever. Urine dense, hazy, left vesicle much enlarged, acute arthritis right knee and left wrist. Oct. 15th, double vasostomy, three washes to each side. Joint trouble completely disappeared in ten days after the first wash. Nov. 25th, proved cured and returned to his wife. Sept. 9th, 1916, wrote to say he is quite well and his wife has had no trouble.

CASE 23.—July 25th, 1914; three years' gonorrhœa, right vesicle. Had all the ordinary treatment until Oct. 18th, 1915; kept on relapsing from right vesicle. On the 20th right vasostomy, three washes. Nov. 2nd, perivesicular abscess developed. On the 3rd abscess opened by perirectal incision, urinary leak. Dec. 3rd, abscess and urinary leak had healed. Tested continually from the 16th to Jan. 1st, 1916, and proved to be cured. Has had no further trouble.

CASE 24.—Nov. 27th, 1922; aged 65, had gonorrhœa *1878, arthritis, iritis*. Married 27 years, wife has had joint trouble for which she could not be examined. Has had relapsing iritis ever since 1878 and right orchitis. Both vesicles greatly enlarged, fluid expressed contained pus and gonococci. Urethra—multiple strictures. Dec. 18th, 1922, internal urethrotomy, double vasostomy, three washes to each. Jan. 6th, 1923, urine clear, prostatic and vesicular fluid absolutely healthy and contained no pus. Apparently cured of his vesicular infection. Nevertheless later on he developed another attack of iritis. There is a possibility he re-infected himself from his wife.

CASE 25.—May, 1914; gonorrhœa one year, married, in a hurry to get back to his wife. Right vasostomy, three washes, cured in three weeks.

Conclusions.

A seminal vesicle infected with the gonococcus or *B. coli*, or other germ, can remain blocked and full of the infecting agent for many years. The victim may suffer from relapsing fever and rigors, from relapsing urethral discharges, from arthritis or iritis, from impotence and sterility, and from neurasthenia. In some cases the neurasthenia is so severe as almost to amount to a psychosis. All these troubles, except the iritis, can be cured by vasostomy.

What, then, are the indications for this operation?

1. I think it is clearly established that it should be employed in all cases of chronic relapsing gonorrhœa (or *B. coli* or streptococcal vesiculitis) in which there is evidence of a thickened closed vesicle or vesicles, and in which four to six months' consecutive and careful treatment by massage, urethroscopy, and so forth, has failed to produce a cure.

operated on since 1914. All had long-persisting vesiculitis except one (Case 22), who had fairly recent joint trouble. In 21 cases the infecting organism was the gonococcus, in three the colon bacillus, in one a streptococcus, and in one of the colon bacillus cases a streptococcus as well.

The operation is one of great importance to married men in difficulties, or to men shortly about to marry and who are pressed for time as regards cure. Seven were already married. One had been married many years, yet his infection dated back to 1878, and he had relapses of iritis and arthritis in 1922 as a result. His wife had joint trouble too. One (Case 22) was married, had acute arthritis, and wanted to get back quickly to his wife. His joints were cured, and he went back to his wife in five weeks after the operation. One (Case 19) had a *B. coli* infection and never infected his wife. One (Case 17) had been abroad, where he became infected with the gonococcus. He returned to England early in 1920 and had to lie to his wife, yet refused vasostomy until the end of 1920, when he submitted to it. Within 21 days of his operation I proved he was cured, and he returned to his wife and had no further trouble. One (Case 13—a doctor) had gonorrhœa 13 years before I saw him. He had been married three years without trouble, then he suddenly flared up with a rigor and swelling of his right vesicle. I washed this out and he was able to return to his wife cured in three weeks. Another (Case 10) had become infected in November, 1920, while in this country, having left his wife behind in one of the colonies. He was pressed for time as he had to return by a certain boat and was not cured. I operated on him in July, 1921, and he was proved cured 14 days later, and just caught the boat fit to meet his wife on his return home. The last (Case 7) had *B. coli* and never infected his wife.

Five of the men (Cases 2, 9, 11, 15, 20) were in a hurry to get married, and could not put off the marriage arrangements. They were all cured in a few weeks and were married happily. Some of these cases were sterile as both vesicles and vasa were blocked. They became fertile after, as the passages were opened up. This was proved in several cases. In only one of the cases (Case 3) was the vas found full of semi-solid material, which made lavage very difficult, yet even he was cured by the procedure. In a few of the others there was some difficulty at first in pressing in the colloid silver, but in 23 cases out of 25 a fine silkworm gut thread could be passed right down to the ampulla without difficulty. The possibility of blockage of the vas must always be kept in mind, and the patient warned that if the condition is found it may render the operation ineffective.

I failed to obtain an immediate cure in four cases. In one (Case 4) the left side was completely blocked, so that this side could not be washed out at all, the right being satisfactory. He had iritis and joint trouble and I failed to cure him. The second (Case 6) had a partial block in the right vas. Only a little colloid silver could be forced through. It started drainage of the vesicle and massage effected a cure in another two months. The third (Case 23) developed a perivesicular abscess, which I had to drain through the perineum, and this led to complete cure. The fourth (Case 24) had iritis and joint trouble. The operation sterilised the vesicle, but a few months later he had another attack of iritis. This leads me to believe that iritis is in a different category to other gonococcal metastases. I believe that attenuated gonococci or their poisons get into the iris and live there indefinitely, so that it is not sufficient merely to sterilise the vesicle of gonococci to get a cure of iritis. I doubt if gonococcal iritis is ever cured—that is to say, rendered free from any possibility of relapse.

Twenty-one of the cases were immediately and effectively cured within three weeks of their operation. I think this is a most impressive statement, which fully justifies the operation for long-standing obstinate cases. The quickness of the results is little short of miraculous. These cases had all had many months, if not years, of the ordinary treatment by means of irrigation, massage, bougies, installations, drugs, and particularly vaccines, ordinary and detoxicated. Yet they had failed to obtain relief. The average length of time they had had the disease was four years, excluding the man who had had it 44 years, yet they were all cured in three weeks by vasostomy.

Seven of the cases suffered from obstinate and crippling arthritis. They were all cured in three weeks and their joint troubles simply melted away. Two had iritis. In one I failed to cure the vesicle because the vas was blocked, and in the other I cured the vesicle yet the iritis relapsed later. There were only two complications. In one a spermatic fistula persisted for a short time. This was before I learnt to drop the vas back after taking out the stitches. In another a perivesicular abscess developed which I drained through the perineum with good effect.

Should one do both sides as routine, or only that side on which the thickened vesicle can be felt? If in any doubt it is better to do both sides. Where it is quite obvious that only one side is at fault it is only necessary to do that side. I operated on one side in 11 cases with one failure, and on both sides in 14 cases, all of which were cured. The results are more certain if both sides are done. Five had one wash only, and four were cured; the other had to be finished by massage. Seven had two washes and all were cured. Twelve had three washes, ten were cured straight away, one developed a perivesicular abscess, and one failed because the left vas was blocked. One had four washes and was cured. I think it advisable to aim at three washes, though in most cases two washes will cure. *It is clear that a single wash will not cure all the cases; further washes must be ensured following on the operation.*

The colloid silver is often passed at the next few acts of micturition. Sometimes it is retained for days and is then usually passed in a nocturnal emission which stains the pyjamas black. That it fills the vesicles as well as the ampulla can be proved by radiography. The vas has a powerful sphincter, so that sperm or colloid silver coming down the vas regurgitates into the vesicle. The vesicle is certainly a reservoir of sperm. It is lined by a few layers of columnar epithelium which secrete a mucinous fluid. Colloid silver appears to have a softening action on inspissated secretion and plugs present in chronic vesiculitis. When the duct is blocked a fresh opening is formed into the deep urethra through which the softened contents are discharged. This can be seen with the posterior urethroscope. Numerous other antiseptic fluids have been tried, but I find there is nothing so satisfactory as colloid silver in strengths of 5 per cent. This is also my experience in the case of pelvic lavage for renal infections.

Two of the cases were suffering from *B. coli* vesiculitis, and had suffered for years from unexplained relapsing fever and rigors. Both these were cured. In one of these cases I also performed epididymectomy. Another had a mixed infection with *B. coli* and streptococcus and was cured. In two of the cases there were accompanying renal infections for which I had to wash out the kidneys. Each received two washes to both kidneys and were cured of their kidney infections.

Schedule of Cases.

CASE 1.—Chronic vesiculitis one year; vasostomy 1914. Proved with help of Dr. Herbst at the London Hospital. Proved cured in three weeks.

CASE 2.—Seen May 26th, 1915; gonorrhœa six weeks. Right vesiculitis July 8th. Treated until Dec. 23rd, when it became latent. On Jan. 15th, 1917, after alcohol, relapse of urethritis from right vesicle. Right vasostomy Feb. 22nd, three washes. Proved cured in three weeks. August 1st, 1918, marriage tests negative. Patient then married, and was seen again Feb. 1st, 1923; his wife and children have had no trouble.

CASE 3.—April, 1917; gonorrhœa three years, treated for three months. Great enlargement of right vesicle. June 27th, 1917, right vasostomy, canal filled by semi-solid debris, two washes given. Needed further massage, but was cured in two months from the date of operation.

condition is unilateral. Of the 185 cases within my knowledge 145 were bilateral, and only 40 unilateral. It is interesting to note that when accessory breasts were present, as in Warren's case, all the breasts partook of the enlargement. Any general stimulus to mammary growth should affect both breasts, and its influence should not be restricted to one side. Unilateral cases, however, are not an insuperable obstacle to the acceptance of the hormone theory. We know that hormones and enzymes often act by liberating other substances which then act directly on the tissues. If that other substance were present in one organ and absent from the other the hypertrophy might occur only on one side. This would also help to explain such extraordinary occurrences as that reported by Young of four sisters who all had families, but none of the four had any milk in the left breast.

Sometimes a parenchymatous enlargement of the thyroid gland in a young girl comes on at puberty, but part of the thyroid gland may remain unaffected. I believe these conditions are analogous, the more so in that enlargement of the thyroid gland sometimes comes on during pregnancy. Moreover, parenchymatous hypertrophy of the breast very commonly starts at the time of puberty. In most patients who have menstruated, menstruation has ceased before hypertrophy is noted. In others, after the breasts have attained a certain size, menstruation has ceased; in one case the growth stopped with the cessation of menstruation. Hutchinson reported a case which preceded the onset of menstruation. There is, therefore, usually some irregularity of menstruation which either precedes or accompanies the change. Pregnancy is a powerful stimulant to mammary growth normally, and sometimes this increase in size may pass the physiological bounds. In these cases the conclusion of pregnancy often permits the breasts to return to normal. Monod reported a case where the breasts became enormous at three consecutive pregnancies, but returned to normal in the intervals. Rosinski had a case in whom this process was repeated four times.

The rate of growth is, as a rule, slow, and sometimes intermittent, though in Zarukow's patient only two and a half months were needed for the breasts to reach a circumference of 57 and 59 cm. In the earliest case of which we have records, that reported by Durston by letter to the Royal Society in 1700, the condition was said to have occurred in one night. This case, however, occurred at a time when imagination played a greater part in medicine than it does now, and probably the lady suddenly awoke to the fact that her breasts were much larger than they should have been. The case was as follows:—

Eliz. Trevers, aged 23, "fair of complexion, brown haired, of an healthy constitution, low of stature, of honest repute, but of mean and poor parentage." This lady was said to have woken up one morning to find her breasts so large that she could not turn or even sit up in bed. Menstruation had stopped some six months previously. Within the short space of two months the skin gave way and ulcers formed and she died a month later of septicæmia. A limited post-mortem examination was allowed; the left breast weighed 6¼ pounds, and the right one 40, the left one was 3 feet 4¾ inches in circumference. "Upon opening it we could find neither water nor cancerous humours, nor anything vitious, more than the prodigious bigness, and the tubuli, and parenchymatous flesh were purely white and solid, and no other than what we see in the soundest breasts of women, or the best udders of other animals."

Other cases which have reached enormous proportions may be mentioned:—

Hamilton	right	27½ lb.;	left	24½ lb.
Owen	”	22 ”	”	23¾ ”
Robert and Amusat	”	30½ ”	”	20½ ”
Dennis and Billings	”	18 ”	”	18 ”
Huston	”	12 ”	”	20 ”

Porter, the breasts weighed 40 lb. between them.

A table drawn up according to the age at which the condition was known to occur is very striking. In 161 cases in which the age was mentioned the figures are as follows.

Between the ages of	11	and	15	there were	43	93	143
” ”	15	”	20	”	50		
” ”	21	”	25	”	26	76	
” ”	26	”	30	”	24		
” ”	31	”	35	”	11		26
” ”	36	”	40	”	8		
” ”	41	”	45	”	5		
Over this age	..	..	48	”	2		

Here we see there are 93 cases of 20 years and under, and 76 over this age, there were 143 cases under 30 and only 26 cases above this age—that is to say, the great majority of cases occur during the age of greatest sexual development and the numbers become progressively fewer as age advances. After the age of 30 the falling-off of the cases is remarkable. The youngest case mentioned as having a great enlargement was 12, though a small one is mentioned at the age of 11. Of the two at the age of 48, one, from the account, was possibly due to a tumour and not to hypertrophy.

Symptoms.

Apart from the increase in the size of the breasts there are no symptoms. The breasts increase in size and still retain their rounded contour, though this may be irregular and bulgings occur in places. The skin over the breast is quite movable and at first apparently normal, though enormous striæ appear in it as the result of its stretching. The veins are distended and clearly seen coursing under the skin. In some cases the breasts are much engorged and of a dusky hue. Durston, Billroth, Simpson, Greig, and others have noticed that the stretched skin has given way and ulceration has taken place. When this occurs, necrosis of the underlying breast tissue usually follows, with septicæmia and death, as happened in all these four cases. McGavin's case was four months pregnant and the breast enlargement was "accompanied by diffuse inflammation," and the breasts "were hot, red, tender, dusky, nodular, long, and pendulous." Abortion was induced, followed later by amputation of the breasts and recovery.

The nipple as a rule becomes flattened out and flush with the surface, and is quite useless for suckling. At the same time the areola becomes much enlarged; it may fade and be difficult to see in non-pregnant patients, but usually becomes darker and more pigmented than normal in pregnant ones. Often the breast feels nodular and irregular, and more like a lactating breast, or even as if it were full of small adenomata; this, as we shall see later, has led to a false idea of the pathology of the disease. In the case under my care, I believe the nodulation was sufficiently well marked to be mistaken for an adenoma and was removed before the general enlargement was sufficient to attract attention to the true nature of the disease. There is no pain experienced during the increase in size, and except for the irksomeness of carrying the large organs about, there is no inconvenience. Porter has reported a case where the breasts were so large and their weight so oppressive that the patient had a frame made to support them on as she lay in bed. Ehrenhaus recorded a case which experienced a good deal of pain, but she also suffered from galactorrhœa, and often a quart of milk escaped from the enlarged glands in 24 hours. After a time the weight of the breasts tends to draw them away from the chest wall, and they hang as by a pedicle. In young girls, where one breast is larger than the other, spinal curvature may be caused by the unequal weight; this was so in Menteil and Benôit's girl of 14½, and also in the false case in a girl of 15 under Mr. Ernest Lane, reported later on in this article.

Pathology.

In cases of true hypertrophy the condition is a parenchymatous enlargement of the glands, all the component tissues taking a share. In a few cases described as hypertrophy the increase in size has been found to be a great deposit of fat, but here there would not be the nodular feel which has been described in the true cases. In the post-mortem

2. It should also be used for cases of chronic arthritis with chronic relapsing epididymitis that do not yield to such treatment.

3. It should also be used for cases of relapsing attacks of fever, rigors, and pyuria, and epididymitis caused by the colon bacillus or other germs, such as streptococci.

4. Finally, I believe it should be used for many cases of severe arthritis in the early stages. Belfield has reported 83 cases of acute posterior urethritis with acute vesiculitis and arthritis, where immediate amelioration has been obtained by vasostomy. In the future I intend to try it for such cases.

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PARENCHYMATOUS HYPERTROPHY OF THE BREAST.

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Hypertrophy of the breast or parenchymatous hypertrophy of the breast is a remarkable phenomenon, most of the cases being so striking that they are either shown at a local medical society or reported in the press. Thus, in spite of its rarity, a great number of cases occur scattered throughout the literature.

A Case Described.

A married woman, aged 27, attended my out-patients' department at St. Mary's Hospital in the beginning of 1920, having been to many other hospitals previously.

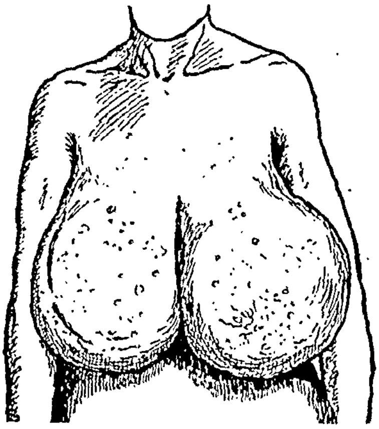
History.—Her breasts had always been large as a girl, though nothing very remarkable. In 1918 she attended hospital and was informed that there was an adenoma in the right breast; she was admitted and the adenoma removed. Later she married, and she was now two months pregnant.

Condition on Examination.—Both breasts were very large, the left being the larger, while the right appears to have had a large piece removed from the upper and outer quadrant, where there is a scar. (See drawing.) The veins were enormously distended, the nipples quite flattened and flush with the skin, the areola enlarged and deeply pigmented. The breasts were very nodular and lumpy and felt as if they were full of large adenomata. She had been advised to have her breasts removed.

Treatment.—She was sent to Dr. Harrison Orton for X ray treatment which had very little effect, and the increase in size went on. At the fifth month of her pregnancy she aborted and the breasts rapidly diminished in size. In January, 1923, the breasts were still large and very pendulous, especially the left one; both were flabby and soft, the lumpiness could still be felt, and the veins were still prominent. She had not been pregnant again, her menstruation had always been normal, but lately had been painful.

Nomenclature.

The condition has been known under many and varying names, such as "virginal hypertrophy," "massive hypertrophy," "diffuse hypertrophy," and lately Dr. David M. Greig has introduced the term "puberal hypertrophy." All these terms indicate the increased size of the breast, and some, such as "virginal" and "puberal," attempt to combine some other characteristic of the condition in the name. The term virginal is inaccurate, as the condition has nothing to do with virginity, while puberal rather confines it to puberty, whereas some of the best marked cases occur in early married life. Greig, who uses this term, subdivides it again into hypertrophy of puberty and hypertrophy of the puerperium; this again is inaccurate, as it is during pregnancy that the enlargement takes place, and during the puerperium that there is often a return to the normal. No doubt under this term are included cases which are not really true hypertrophies. Very obese individuals may have enormous breasts in no way pathological, but merely due to large collections of fat. Even young people can be afflicted in this manner, as in one of Keyser's cases, where the girl was only 19 years of age. In some cases chronic interstitial mastitis may increase the bulk of the organs sufficiently for them to be included in the term hypertrophy. Some cases in people over 40 years of age are of this nature. In many cases, as we shall see, there is a mistake in diagnosis; it is probable that cases of acute cancer have been included, and certainly many cases with large and rapidly growing lipomata or adenomata, and perhaps even elephantiasis.



Drawing showing enlargement of the breasts.

Some writers exclude from the category of true hypertrophy all cases in married women where there is a permanent enlargement associated with pregnancy, but I cannot understand why. In true cases we get a real hypertrophy, all the tissues of the breast taking part in the enlargement. For these reasons I have preferred the term parenchymatous hypertrophy of the breast, as that accurately describes the condition at whatever time of life it occurs. The term parenchymatous was also employed by Durston in 1669 when describing the post-mortem appearance in the earliest case on record. The condition has also been described as occurring in men, but in them the disease seems so essentially different, whatever the form of gynæcomastia met with, that I do not include them.

Cause and Ætiology.

The cause of the disease is quite unknown. Trauma, cold, heat, and irritation have no effect; celibacy and heredity have no influence. The breast being one of the organs necessary to complete the process of generation, the association between it and the other sexual organs has long been recognised, and in this disease the association is emphasised. Two facts stand out clearly. The enlargement of the breasts begin first at or about the age of puberty, and, secondly, during pregnancy. Obviously, therefore, it must have something to do with the other sexual organs or sexual secretions, but what this association is we do not know. There are only two cases on record with any known organic disease in the organs of generation—Bartel's case, where a girl of 14 had an infantile uterus and very small ovaries, and Gran's case, where a girl of 15 had tuberculosis of the lungs and ovaries. The modern view is that the condition is due to a hormone or lack of, or excess of, a hormone, secreted by part of the sexual apparatus, which means that very little is yet known about it. The great stumbling-block to the hormone theory is the fact that sometimes the

THE DIGESTIVE FUNCTION IN PULMONARY TUBERCULOSIS.

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That every phthisical patient has been, is, or will become, a dyspeptic is probably the most definite statement to be found in the literature of pulmonary tuberculosis.[1] Not only will he be afflicted with indigestion, but constipation with intermittent attacks of diarrhœa and abdominal pain will add to his difficulties. In not a few cases this almost inevitable disturbance of digestive function causes more discomfort and disability than do the symptoms directly referable to the lung condition. Daremberg said, "l'estomac est la place forte des phtisiques et l'alimentation leur grand moyen de défense."[2] It still remains, to-day, a desirable part of the treatment of pulmonary tuberculosis—if only from the point of view of the patient's comfort—to safeguard this bulwark of defence. More rational methods of dieting have replaced the excessive feeding insisted upon by Walther,[3] and the stereotyped prescription of milk in large quantities is gradually ceasing to be a fetish, but the most suitable diet will be given only when the true nature of the alimentary derangement becomes known.

Hyperchlorhydria Probably Fortuitous.

Hyperchlorhydria and hypochlorhydria have been reported with equal frequency, Fishberg stating that "analyses of the gastric contents have not revealed any constant changes."[4] From the findings in fractional gastric meals and the results obtained by treating a still larger number of cases according to the conclusions derived, it would appear that hypochlorhydria or hyposecretion is the rule when dyspepsia is the sequel of infection of the lungs by tubercle bacilli. Quite a number of phthisical patients have had hyperchlorhydria for many years prior to their becoming tuberculous, and consequently their indigestion bears little or no relation to their lung condition; I would suggest that these cases may have formed the majority of the cases of hyperchlorhydria that have been reported. One patient, who had had a gastro-enterostomy for ulcer performed two years previously with but temporary relief, stated that her indigestion became less severe when her chest began to trouble her. This history is not uncommon where the dyspepsia has been of long standing, but it must not be confused with a similar history obtained in cases of gastric mode of onset in which the dyspeptic symptoms become less marked as the pulmonary symptoms appear. It should also be remembered in this connexion that hypersecretion may be present without symptoms in an otherwise normal subject.[5]

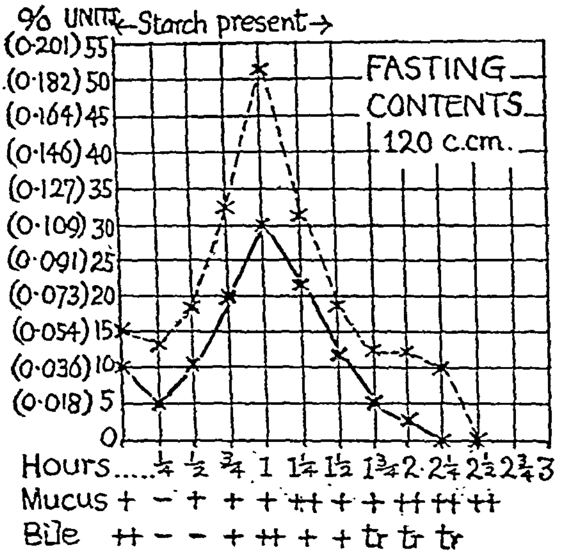
It is suggested, then, that the usual effect of tuberculosis in the digestive function is one of inhibition, the quality and quantity of the gastric secretion depending on (1) the degree of inhibition, and (2) the quality and quantity of the secretion prior to the tuberculous onset.

Illustrative Cases.

The charts obtained in these cases of hypochlorhydria are of two types. The first, as exemplified in Case 1, shows reduced acidity, though 30 units are usually established, and rapid emptying of the stomach. The indigestion in these instances is never severe and readily yields to treatment directed at the stimulation of gastric secretion. Hunger pain coming on two hours or more after a meal is the predominant symptom, which is temporarily relieved by the ingestion of food. This type is uncommon, and at present it is difficult to say whether it is the result of slight inhibition or only an early stage of the second variety.

Case 1.—(First type, Chart 1.) The patient, a male aged 57, was admitted complaining of cough for past two years. Sixteen years previously he had a slight hæmoptysis, after which he became subject to coughs and colds. Two brothers died of pulmonary tuberculosis, aged 29 and 31. Three months prior to examination the patient's appetite failed, and he began to feel worse. Epigastric pain occurred between one hour and one and a half hours after meals, and continued until the next intake of food, which usually, though not always, relieved the symptom. No history of vomiting was obtained, but nausea coming on at the same time as the pain was complained of. Constipation had been obstinate during these months.

Chart 1.



Case 1, type 1 (May 22nd, 1922).—Continuous line = free acid curve; dotted line = total acidity curve; tr. = trace.

Abdominal Examination.—This proved negative, save for the detection of a slight epigastric fullness and tenderness on the left iliac fossa.

Chest Condition.—Marked fibrosis of the right upper lobe with infiltration of the middle and lower lobes of the same side. The left upper lobe was also infiltrated. Rhonchi were heard extensively over the chest.

Radiological Report.—Stomach slightly low, but tonic vigorous peristalsis. No filling defects or spasmodic contraction. Duodenal cap normal. Six hours after ingestion the stomach is empty and the food occupies the terminal coils of small intestine, cæcum, and ascending colon.

The second type of chart, as shown in Cases 2 and 3, is much more common, and forms the basis of this communication.

Case 2.—(Second type, Chart 2.) The patient, a male, aged 36, was admitted on April 4th, 1922, with very extensive tuberculous lesions of both lungs, with a cavity in the right upper lobe. Whilst at a sanatorium in the south of

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(*Continued from previous column.*)

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Huston: The American Journal of Medical Sciences, Phila., 1834, xxviii., 374.

examination of the case reported by Greig, which was conducted by Prof. L. R. Sutherland, the report was shortly as follows:—

> "To the naked eye the condition seemed unusual. Seems to be generalised hypertrophy, with glandular hyperplasia in nodular form. General appearance suggests benign lesion. Microscopical examination showed the structure mainly fibrous, with gland spaces filled with altered epithelium." Greig continues "that the peculiar shedding of the epithelium into the gland spaces and ducts was as is found in some cases of great glandular activity. The distension so produced, together with the decided glandular hyperplasia, brought about a sort of nodular formation of gland tissue, suggestive of, but in no way of the nature of adenomata."

This last sentence is significant as there is an idea current that the condition is fibro-adenomatous, and at a meeting of the Royal Society of Medicine, where a case of hypertrophy of the breasts was shown, two speakers of eminence declared the condition to be "fibro-adenomatous." If by this term they meant that the enlargement was due to the development of fibro-adenomata, I can only say that such is not the fact, no case having been so reported after investigation. Billroth's description on post-mortem examination on one of his cases was as follows:—

> "The cross section of the mamma resembled that of a uterus studded with numerous fibromata, but the tumours were softer and contained more juice than ordinary uterine fibrous tumours."

This evidently refers to the nodules described by Prof. Sutherland. Neither Billroth nor Sutherland thought the nodules resembled fibro-adenomata. If, on the other hand, the speakers meant that the fibrous and adenomatous elements of the glands were enlarged, they should also include the fatty tissues, and the condition becomes parenchymatous. If they spoke of a parenchymatous change, then the term fibro-adenomatous had better disappear in connexion with the disease, as it is the term intimately associated with the common fibro-epithelial tumour of the breast.

Diagnosis.

This would seem so obvious that it need not be dilated upon, but this supposed ease of diagnosis has sometimes been very detrimental to the patient. We find many cases recorded in which the breast has been removed, and to the astonishment of the operator the condition has proved quite different from that expected. Surgeons of the highest eminence have been deceived. Thus Billroth removed what was thought to be a case of unilateral hypertrophy and found that it was a huge retro-mammary lipoma. Brodie very nearly did the same thing. It is especially necessary to be careful in unilateral cases. Greig does not believe that unilateral cases can occur, and thinks they are always due to causes other than pure hypertrophy; while not agreeing with him, I would urge special caution in dealing with them.

The following is an example:—

A girl, aged 15, was admitted to St. Mary's Hospital under Mr. Ernest Lane on March 18th, 1905, for hypertrophy of the right breast.

History.—In January, 1904, the right breast was noticed to be larger than the left, and it has gradually grown since that time. There was no pain till about six weeks ago, since when there has been a slight aching. She had had to wear the breast in a suspender. She began to menstruate when 14 years old, a little irregularly at first but now regularly. During the periods the breast always swelled perceptibly.

Condition on Admission.—The patient looked well and had a good colour. The right breast was much larger than the left and hung down to within an inch of the umbilicus. The veins over it were enlarged and the nipple flattened. The breast felt full of hard masses from the size of a walnut to that of a hen's egg; it felt very heavy for its size. There were two hard glands in the axilla. The right labium majus was the same size as the left.

Operation.—The breast was removed by an incision round its base. It weighed over 3 lb. after the fluid had run from it, was hard and lumpy to the feel, but contained no cysts.

Microscopical Examination.—The tumour was an adenoma, and the drawing which accompanied the account showed the thin flattened out breast, underneath which lay a large adenoma.

Hoenigsberger illustrates a similar case in which the enlargement was due to enormous bilateral fibro-adenomata. Muchanoff illustrates an equally extraordinary case. The appreciation of these mistakes may have had something to do with the supposition that true parenchymatous hypertrophy was due to fibro-adenomata. Deaver and McFarland give an excellent illustration of a case of apparent symmetrical hypertrophy due to bilateral lipomata. There is a possibility, too, of mistaking elephantiasis of the breasts for hypertrophy in those who have been to the East; Manson illustrates a case in which, however, the diagnosis was rendered easy by the fact that the left leg was affected as well. These mistakes having been recorded, we may be quite sure that there are others in which the perpetrator has not been quite so frank. It is just as well, therefore, to draw attention to the fact that unless care be taken mistakes can be made as easily in this disease as in any other.

Treatment.

There are sufficient cases recorded in which the condition improved owing to some change in the sexual influence, such as menstruation ceasing, pregnancy commencing, or, more frequently, pregnancy ending, to warrant a waiting policy being adopted at the outset. Some observers think that these are not cases of true hypertrophy simply because they get well of themselves, but as we know really so little of the true cause of the disease this opinion seems to be hardly warranted. Local measures such as pressure and massage may be tried, potassium iodide or collosol iodine may be given as an alternative, but none of them have much effect. Mammary extract has been administered without result. One would rather expect that extract of the uterus, ovaries, or corpus luteum, or a mixture of them might have a better effect. In one case I tried a course of X rays which the patient declared had no effect, and probably the conclusion of the pregnancy was the real cause of the return to normal.

When the breasts are not so enormous as to impede movement it is best to counsel patience, especially in young girls. In some patients, however, the general health suffers severely, either from the disease or from anxiety, worry, and self-consciousness, and in these cases operation should be advised. It is remarkable with what unanimity all writers record the fact that the general health improves immediately after the removal of the breasts. Where the breast increases in size during pregnancy and diminishes after parturition, the patient must make her choice. Usually the breast is useless for suckling as the nipple has disappeared; in Zarukow's, Menteil's and Benoit's cases, to mention only two, the breasts were functionless after parturition. It is for the patient to decide whether she will retain these enormous but useless appendages, which are often very much in the way, merely for sentimental reasons.

In all cases where the breasts are becoming unduly dusky, congested, or inflamed, or where the skin threatens to give way, amputation should be performed without delay.

The operation is easy, a visible scar can quite well be avoided, and the disease is cured at once. In bilateral cases one breast should be amputated, and after an interval of three weeks or more the second breast can be dealt with. The existence of pregnancy seems no bar to the operation, which is remarkably free from shock. In amputation of the breast it is advisable that this be carried out by two flaps, a large flap cut from the front of the breast and a small one fashioned from below. When the breast is removed the large anterior flap can be sewn into the position of the normal costo-mammary groove. If a certain amount of the breast tissue be left a very fair breast can be reproduced; it will have no nipple, but the appearance will be quite presentable, and there will not be the disfigurement usually left by such operations.

(*Continued at foot of next column.*)

siderable quantities, and increases in amount towards the end of the examination, but there seems to be little relation between the amount present and the severity of the symptoms.

General Inhibition of Alimentary Function.

The symptoms and clinical findings point to a general inhibition of alimentary function. The tongue is usually dry and furred as a result of constipation; the unpleasant taste in the mouth, to which this condition gives rise, tends to increase the anorexia and intensify the distaste for food, which in turn inhibits the salivary secretion, thus completing a vicious circle. Owing to the dryness of the mouth, particles of food will adhere to the teeth, undergo bacterial decomposition, and give rise to dental caries and fermentation. In the absence or diminution of free acid, the gastric secretion loses its bactericidal properties and the digestion of proteins is incomplete, so that the protein derivatives undergo bacterial decomposition in the intestine. The greater amount of this contaminated saliva swallowed at night will tend to increase the bacterial decomposition, and so the more severe flatulence and the nocturnal occurrence of distension and flatus are explained. The intolerance of fats is possibly due to their favouring this decomposition by their tendency to form a film over the proteins, which are thus prevented from coming into contact with what little acid may be present. Fats also seem to have the power of lessening the secretion of acid or of lengthening the time taken by the stomach to empty itself.

The result of this continued distension and irritation of the intestine may be, at first, increased peristalsis with diarrhœa, but will ultimately be general stasis with constipation. As the intestinal contents remain longer in the cæcum than elsewhere, it is only to be expected that this viscus would be considerably affected, dilatation being usual. As is so frequent when the tone of the cæcum is diminished, a "greedy colon" is present, and this gives rise to a hard dry stool.

In the absence of the maximum peristalsis of the stomach, which only occurs when the free acid reaches 30 units,[6] and with the delay in the regurgitation of bile and the presence of a dilated cæcum, it is not unreasonable to suppose that the ileo-cæcal valve is incompetent and fails to respond to its normal activator, the entry of food into the empty stomach. Each of these defects will tend to increase the loss of tone of the whole alimentary tract. Whether the diminution of the free acid is the direct result of the presence of tubercle bacilli in the stomach, or is the result of toxæmia, is uncertain, and while Rehfuss has, in many cases, found the bacilli in the fasting contents with greater ease than in the expectoration,[7] and the writer has found them in more advanced cases, it is more reasonable to suppose the toxæmia to be the cause. It seems apparent, however, that the diminution of the acid is the key to the ensuing disturbance of the whole alimentary tract.

Treatment.

(1) The mouth and teeth should be kept clean by an acid mouth-wash used each night and morning. All carious teeth should receive attention. It is essential that no particles of food should remain in the mouth after the evening meal.

(2) Acid. nitrohydrochlor. dil. should be given in doses of 10–30 minims before or during each meal. This helps to make up the deficiency in the gastric secretion and to increase its bactericidal properties. In most cases sodium bicarbonate taken before meals will excite secretion, but in the dyspepsia of tuberculosis—with the possible exception of type 1—it seems as if this stimulation is insufficient. The acid is, however, a definite stimulant to the salivary secretion, and this latter action may be increased by combining it with the infusions of gentian, calumba, or quassia. Glycerine pepsin may be added, for although it is held that pepsin is rarely, if ever, diminished to any appreciable extent, hyposecretion is so often coincident with hypochlorhydria that this ferment may be diminished in amount. Medicinal treatment seems incomplete without an intestinal disinfectant. Salol and dimol were used, the latter proving more effective. One tablet night and morning seems to be the required dose, as in one or two instances diarrhœa which had occurred ceased when the number taken was reduced to the two per day, and it was thought that the larger dose was proving too strong in its action.

(3) With regard to aperients, an intelligent patient will soon learn to appreciate a thorough bowel action, and will make known the presence of an insufficient though regular action. When the cæcum has become dilated and the colon "greedy" agar-agar, which appears to have a greater affinity for water than that developed by the colon, should be added to the aperient, the best of which is probably liquid paraffin. Aperients which have an irritant action should be avoided. The patient should be advised as to the desirability of regular defæcation, in the hope of regaining the action of the ileo-cæcal valve as the general tone of the tract improves, which it will do if the condition has not become chronic.

(4) No dyspeptic patient should be required to take an excessive diet. Although this might increase his weight, it would assuredly increase his dyspepsia. The individual taste should be considered, and the diet altered to suit it. An attempt should be made to present the food in such a way as to excite psychical secretion. Milk should be given in moderation, and the addition of citrate of soda will often prove effective in overcoming any difficulty experienced in the assimilation of moderate or reduced amounts. Any mixture of proteins with fats in a liquid form should be avoided. Meats are better cooked in their own juices; milk should not be given at meals at which meat is served; fish should not be fried in oils, and, if possible, the fat on protein should be crisp—as, for example, that of bacon. Carbohydrates, which are known to excite the secretion of acids, though they do not require or use it, should be served at meat meals.

If the above treatment is carried out an increase in the amount of food which a dyspeptic consumptive patient can digest without discomfort will often be noted, with an improved reaction to the specific pulmonary treatment which has been adopted in that particular instance.

I wish to record my sincere thanks to Dr. J. J. Perkins and Dr. L. S. T. Burrell for permission to investigate their cases at Brompton Hospital, for their kind advice, and for their interest and encouragement in this work.

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PUBLIC HEALTH WORK IN CZECHO-SLOVAKIA.—The Czecho-Slovak Ministry of Health, with a view to securing improved coöperation between voluntary and official health agencies, has lately issued a circular letter to district health officers, inviting them to coöperate in the programme of the Association for the Protection of Mothers and Children and the Masaryk League against Tuberculosis. It is proposed to establish a local branch of the League, with a dispensary, in every district which has approximately 60,000 inhabitants, on lines agreed upon by the organisations represented in the National Council of Social Hygiene, which held its summer session on July 4th. It was then decided that the Red Cross, tuberculosis, child welfare, temperance, and venereal diseases associations and the associations for the social welfare of the young and the education of cripples should also possess centres in each district of similar population. It is hoped that this coördination of effort will increase efficiency and prevent overlapping of work.

England in the preceding November he first became subject to indigestion, which commenced as a feeling of fullness after the evening meal. About January, 1922, the condition became worse, flatulence occurring after each meal and at nights. Had never had any actual pain or vomiting and only two short attacks of slight diarrhœa.

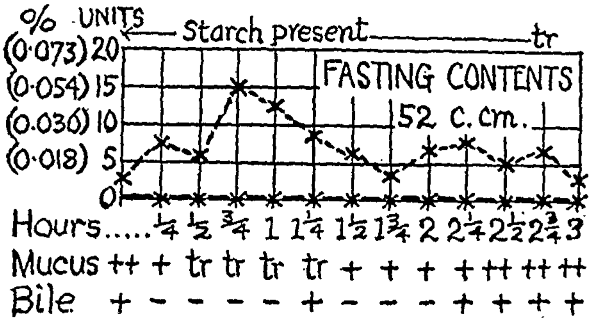
Whilst under observation it was noted that the flatulence continued for about one hour after each meal, but that the patient would be awake for two hours each night (between 12 and 3 A.M.) on account of eructations and the passage of flatus. Fish, eggs and milk, and fat of all kinds seemed to aggravate the condition.

On May 17th, 1922, the acid mixture and dimol were first administered, and one month later, immediately prior to transfer to sanatorium, all symptoms had abated. After transfer the condition recurred, but when the same lines of treatment were used the symptoms again diminished, but the patient died on August 3rd from tuberculous meningitis.

I am indebted to Dr. Frederick Heaf, of Colindale Hospital, for the post-mortem findings from which I quote:

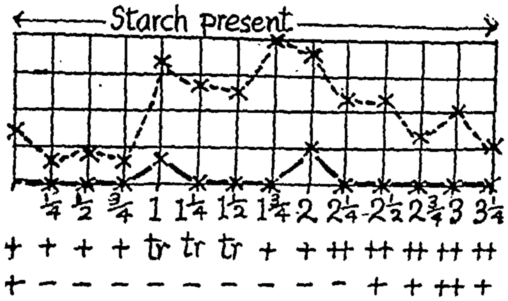
> "There was extensive tubercular enteritis and appendicitis with large abdominal glands. The mucous membrane of the stomach was swollen, and there were many small submucous hæmorrhages, giving a very congested appearance to the surface, particularly toward the cardiac end."

CHART 2.



Case 2, type 2 (May 16th, 1922).—Tubercle bacilli were found in the fasting contents.

CHART 3.



Case 3, type 2 (June 23rd, 1922).

CASE 3.—(*Second type*, Chart 3.) The patient, a female aged 27, was admitted on Feb. 27th, 1922, with left-sided disease, and complaining of palpitation and sleeplessness. A left artificial pneumothorax was induced on March 3rd. Incomplete collapse was effected, and a pressure of +8 cm. of water maintained in the hope of increasing the degree of collapse, but as the palpitation became more marked the pressures were lowered to +1. As the palpitation continued, compelling the patient to remain in bed, a gastric examination was made, though dyspeptic symptoms had not been a marked feature. Refills, which had been given weekly, were stopped on June 8th.

The fasting contents measured 45 c.cm., and contained a few sarcinæ. Fillings were resumed on June 30th, the palpitation having diminished in severity after the administration of acid and an intestinal disinfectant. Gastric treatment was continued for about two months, and, at the time of writing, she is now up all day, working on second grade for two hours each afternoon and having refills with an end pressure of 1½ cm. water every ten days. There have been no attacks of palpitation during the last eight weeks.

Symptoms.

The following symptoms are noted in association with the second type of chart (Charts 2 and 3).

(1) *Flatulence.*—This occurs from a quarter to half an hour after meals, and whilst of short duration in the morning and mid-day becomes marked after the afternoon and evening meals. In the more severe cases flatulence accompanied by intestinal flatus occurs towards midnight, or the early hours of the morning, about five or six hours after the last intake of food. One case—the most severe in our series—lost two to five hours sleep each night on this account.

(2) *Pain.*—When questioned the patient will describe a feeling of "fullness" or "tightness" rather than actual pain. After meals the "tightness" is more or less restricted to the epigastrium, and is relieved by eructations, whilst at night it becomes more generalised, and is relieved by the passage of flatus.

(3) *Nausea.*—May be constant or may come on at the sight of food, during, or immediately after a meal; the latter time being commonest. It is never intense, but is probably the earliest symptom of which complaint is made.

(4) *Vomiting.*—This is never a marked feature, and when it does occur is usually the climax of an attack of coughing, or is the result of irritation of a lesion of the pharynx or larynx during swallowing. Morning vomiting occurs in a few instances from time to time, but the attacks rarely last longer than one week.

Intolerance of Fats.

The main feature is the intolerance of fats alone or in a mixed diet. Whilst some patients state that they cannot take fat of any description since it increases their indigestion, the majority find less inconvenience if they take their fats alone rather than mixed with proteins. Soups are often avoided by them because of the fat, and fat is cut off bacon unless it be crisp, whilst milk or milk and egg is felt to increase the symptoms. Cod-liver oil and malt and milk are disliked by the majority of tuberculous subjects, and almost universally by them if their dyspepsia is marked, but numbers take both, though they disagree, simply on account of medical advice.

Clinical Examination.

Examination of the abdomen in early stages often proves negative. In the later stages, however, the stomach is more often dilated, though succussion is not common, whilst the cæcum is almost invariably dilated, and splashing is easily elicited. The colon is frequently palpable as a hard tender band in the left iliac fossa, the tenderness being most marked in long-standing cases with chronic constipation. Epigastric tenderness, if present, is slight, and hyperæsthesia seldom, if ever, present.

Gastric Analysis.

(1) *Resting Gastric Contents.*—This varies from 25 to about 75 c.cm., but owing to the quantity of mucus present it is difficult to be certain that the stomach has been emptied. In one case it was impossible to obtain more than a few cubic centimetres, though the tube was withdrawn and cleaned three times, whereupon the examination was abandoned. Micro-organisms—staphylococci and streptococci—are often present in greater numbers than would be likely to result from contamination. Lymphocytes are commonly found in cases where the chest condition is advanced and the amount of sputum considerable. The amount of bile varies considerably.

(2) *Acidity, &c.*—The free acid may be absent, present in small amounts at intervals, or constantly present, but reduced in amount, the total acidity then following the free acid curve. Thirty units, or 0·1 per cent., is seldom established. Starch is still present after a gruel meal at the end of three hours or longer. Bile is rarely present before two and a quarter hours after the test-meal has been given. Mucus—both mixed and free—is present in con-

two cases of rupture of infected hydronephrosis.[3] Of these he makes the interesting observations: (1) Tendency to spread upwards simulating subphrenic abscess; (2) rupture into the fatty capsule caused a tumour which was mistaken for the kidney itself; (3) predominance of peritoneal symptoms and signs. Of these the first two do not appear to result from the traumatic rupture, whilst the latter does to a marked extent.

The condition of traumatic rupture seems to be of such rarity that it is to be doubted whether conclusions drawn from a study of 12 cases can be of much practical value. It nevertheless presents points of interest from clinical, therapeutic, and pathological points of view.

Diagnosis.

Clinically, diagnosis appears to be essentially difficult. Should signs pointing to rupture of kidney (especially if there be reason to suppose that the ureter be injured) supervene after an injury which seems *too* slight *to* be the cause of rupture of a normal kidney, the condition may be suspected. Apart from this, correct diagnosis would seem to depend on evidence pointing to pre-existing hydronephrosis. Such evidence existed in Cases 1, 8, 9; in the case detailed at the beginning of this article the only history that could be obtained before operation was that of indefinite indigestion. After the diagnosis had been made close questioning elicited a typical history of intermittent hydronephrosis. Even should a definite diagnosis of ruptured hydronephrosis be made the case is not complete. We require evidence of the function of the opposite kidney; we also require evidence excluding coincident abdominal injury. Cystoscopy should give the first; but it would seem that where there is any doubt a small abdominal incision will give greater certainty and safety.

From a study of reported cases, no case appears *to* have been correctly diagnosed before operation. In Case 11 a diagnosis of ruptured kidney was made after laparotomy. In my own case the *pre-operative* diagnosis of injured ureter was shaken by the discovery that the tumour appeared to have no connexion with the usual site of a renal tumour; only after laparotomy was *the* seat of injury located with certainty, and only when the collapsed kidney was being delivered was complete diagnosis arrived at. Unfortunately, these cases are urgent. Since renal injuries are, and should be, treated expectantly, they reach the surgeon late; time and facilities do not allow of complete urological investigation. It therefore seems inevitable, in the present state of our knowledge, *that* a preliminary laparotomy should form the prelude to exact *diagnosis.* Difficulty has arisen because of the absence of *any* evidence pointing surely to renal injury. In Cases 9, 10, and 11, which are clearly reported, it is noted that there was no hæmaturia. In Cases 1, 2, 3, 4, 5, and 7 this was not recorded. Only in Cases 6 and 8 and in my own case was hæmaturia definitely noted as a symptom. The rapid development of a swelling is not confined to urinary extravasations. The site of the swelling should be a guide; but it seems that only in the cases where rupture is confined to the fatty capsule that a renal tumour is mimicked; where the fatty capsule is torn spread at a distance is common (Cases 3, 5, 7, and my own case). Percussion note was dull in two cases (9 and 10).

Ætiological Factors.

Though a thin-walled hydronephrosis may be ruptured by very slight violence it by no means follows that patients with hydronephrosis are less subject to the severer forms of violence. It seems best to classify three grades of violence: (1) Very slight—such as would be expected *to* produce no injury in a normal subject (Case 7, doubtful); (2) slight—such as might be expected to produce slight external bruising, but no incapacity, in a normal subject (Cases 3, 5, 6, 8, 10, 11, and my own case); (3) severe—second rupture (Cases 2, 4, 9, and 10). With regard to evidence pointing in the direction of congenital deformity, since the bulk of the cases of hydronephrosis seem to be due to imperfect development, in this series, Cases 1, 8, 10, 11, and my own case were certainly, and Cases 3, 4, 5, and 6 probably, of this nature. Such evidence may be classed as (*a*) general—club-foot, hare-lip, polydactylism, &c.; and (*b*) genito-urinary—herniæ, undescended testis, epi- and hypo-spadias.

Pathology.

Rupture in these cases lends support to Kuster's views on the mode of rupture of normal kidneys. The rupture is radial, and appears to indicate a burst rather than a break, or crush. Coincident tearing of the peritoneum is noted in Cases 6, 8, *and* 9. *Such a* high proportion—25 per cent.—is *a strong argument* in favour of a preliminary laparotomy for diagnosis; although in all three cases this appears to have been noted and repaired. There is, however, little doubt that an abdominal incision, in addition to its previously discussed advantages, gives a better chance of removing any soiling with urine or with blood-clot, as in Harrigan's case.

Therapeutics.

Nephrectomy is the operation of choice. No form of repair can be expected to hold under the pressure proximal to ureteric obstruction. Plastic operations on the renal pelvis call for careful planning and aseptic conditions. Should there be evidence of bilateral hydronephrosis and renal insufficiency a nephrostomy pending more complete investigation of the urinary functions would seem indicated. The condition has had a high mortality; of the 12 collected cases 5 died (41 per cent.), but the more recent cases of the series show a greatly improving record.

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[3] Brentano, A.: Zeit. f. Urologie, 1912, vi., 713.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

THE second annual meeting of the Society was held on Friday, July 20th, under the new President, Colonel **L. W. Harrison**, R.A.M.C. (retd.)

Mr. **Frank Kidd** read a paper entitled "Vasostomy for Chronic Seminal Vesiculitis (a New *Technique*)." (The paper will be found in full on p. 213.)

The **President** expressed the thanks of the Society for this contribution, remarking that all who had to do with these difficult cases would agree that they were the bugbear of the worker in the field of venereal diseases.

Dr. **David Watson** said he had been discouraged from doing the operation described by reading an account of some experimental work which was done in America. The difficulty of that worker was to find an efficient gonococcocide which yet should not damage the tissues of the vas. After hearing this minute description of the operation and the results Mr. Kidd had secured, he intended to try it in future suitable cases. He would particularly like the same make of cannula as Mr. Kidd used. With regard to the use of colloidal silver, some doubt had been thrown on the use of colloids, and with those doubts he felt some sympathy. His use of colloidal silver in gonorrhœa had not been so happy as Mr. Kidd's. He could not agree that the behaviour of gonococcal retinitis or iritis after treatment placed it in a category different from that of arthritis; he had found the iritis clear up as readily as the joint trouble. He could only remember one case in which non-operative treatment failed to clear up the chronic vesiculitis; probably, however, the operation now described cleared up the condition in a much shorter time.

TRAUMATIC RUPTURE OF A HYDRONEPHROSIS.

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A CASE of this rare accident having recently come under my care, I feel that the clinical history may be of interest. A somewhat cursory search of the literature has enabled me to trace 11 previously reported cases, which, with two exceptions emanating from America, are all reported in continental journals; a list of these cases is therefore added, with a very brief review of the cases. I know of no English case or specimen which illustrates an accident whose rarity is its chief claim to notice.

Author's Case.

A female, unmarried, aged 50, whom I saw in consultation on June 9th, 1922, gave the following history. At 8 P.M. on the 8th she slipped from a chair on which she was standing; she then stumbled into the edge of a washstand, striking her left side a blow of moderate severity. Immediately she suffered violent left-sided abdominal pain, and shortly afterwards vomited. Pain continued, and next morning she was seen by her doctor, who advised her removal to a nursing home for observation.

Condition on Examination.—I saw her at 8 P.M. on the 9th. Pulse had risen from 80 to 108; temperature 99·4° F.; she had vomited once, and had passed urine naturally several times since the accident; the urine contained scanty red blood cells. A typical abdominal facies. Abdomen not distended; no evidence of free fluid; extreme tenderness and rigidity on the left side; rest of abdomen appeared normal. Catheter specimen contained scanty red cells.

At 9 P.M. a general anæsthetic was administered, and as the rigidity disappeared a tumour became apparent. This was a swelling about the size of a fœtal head. It was fixed, its upper limit below the costal margin, its lower in the left iliac fossa. Its contour was rounded, and it did not extend into the loin. Colon resonance could not be made out. At this stage the clinical diagnosis was "injured ureter" and it was decided to open the abdomen because: (1) the swelling had not the character of a renal tumour; (2) peritoneal injury could not be excluded; (3) it offered the chance of determining the presence of another kidney.

Operation.—The abdomen was opened at the inner border of the left rectus abdominis. No free fluid found. Swelling lay to inner side of descending colon. Puncture showed its contents to be blood and urine. Right kidney appeared normal in size and position. Abdomen was closed, a small tube being used because of leakage at the puncture. Patient in right lateral semi-prone position. A nephrectomy was done through the oblique incision. The only difficulty was in distinguishing the collapsed sac from the descending colon. Tubes were removed in 48 hours. Healing was uneventful. No evidence of renal insufficiency appeared, and the patient left the home after three and a half weeks.

Specimen.—The specimen, now in the hands of the curator, Royal College of Surgeons of England Museum, is a thin-walled left hydronephrosis of congenital type. Ureter is kinked and narrowed at its junction with the pelvis. At the lower pole are two irregular radial tears about three-quarters of an inch long. A third tear at the hilum was produced during delivery of the kidney.

Cases Previously Reported.

Oehme,[1] of the Surgical Clinic, Tübingen, reports a case in detail, which was operated on by Prof. Hofmeister, and quotes the following[2]:—

1. Schetelig.—Patient "born with a big belly." Three attacks of pain and hæmaturia. Operation: Median incision, transperitoneal nephrectomy. Patient died 36 hours later. Post mortem: A large burst hydronephrosis.

2. Cantu.—Man of 65 fell from a tree, and felt a tearing sensation in the left side of the belly. A large fluctuating tumour appeared; he had fainting attacks and vomited; three days later he died. Post mortem: A burst hydronephrosis due to calculus.

3. Schede.—Woman, aged 26. Five days after a fall across a basket a large abdominal swelling diagnosed as a twisted ovarian cyst. Transperitoneal nephrectomy. Patient died; necropsy showed a large burst hydronephrosis.

4. Lampe.—A sailor, aged 16. Fell a distance of 20 feet into a ship's hold. Continued to work for one and a half days; operation on the fifth day after his accident. Laparotomy and drainage. After operation he developed a large urinary fistula and wasted rapidly. Died 12 days after operation. Post mortem: A tear in the lower pole of a large hydronephrosis.

5. Dodge.—A man of 35 received a blow on the left side with a cudgel. Three days later he was admitted to hospital. There was a large fluctuating intra-abdominal tumour. Laparotomy, transperitoneal nephrectomy; patient recovered. Specimen was a large hydronephrosis, with two ruptures in the pelvic portion.

6. Suter.—An apprentice of 16 fell, striking his lumbar region against the rungs of a ladder. Violent pain, sickness, and hæmaturia followed. Bladder injury was suspected and a suprapubic incision was made. This was closed, and through a pararectus incision extending into the loin a large hydronephrosis which had ruptured into the peritoneum was removed. The patient recovered.

7. Gaudiani.—A young man, after lifting a heavy weight, appeared to suffer from perityphlitis. At operation an old-ruptured hydronephrosis was revealed, and was removed. Recovery. This case might appear to come under the heading of spontaneous rupture, together with Prof. Brentano's two cases. There was, however, the definite history of trauma, and it appears that very slight violence may suffice to rupture one of these thin-walled sacs.

8. Rehn.—A child, aged 8, had had a swelling in the left side since birth. A fall across the edge of a box resulted in severe pain, vomiting, and hæmaturia. Bladder injury was at first suspected. A suprapubic incision was made, which was then closed. An incision in the side led to the discovery of a hydronephrosis as large as a child's head. Nephrectomy was performed, and the peritoneum, which was torn in one place, was repaired. Death followed three days later. In this specimen there was a tear at the upper pole, and the ureter was partly torn away from its junction with the pelvis.

9. Hofmeister's case was as follows. A man of 26 had enjoyed good health until one year before his second accident, when he was kicked in the scrotum by a horse. This injury incapacitated him for 14 days; but he suffered no urinary symptoms. From this date he noticed increasing swelling of his abdomen. In November, 1900, he was again kicked by a horse. The blow struck the left side of his abdomen. For a brief time he was unconscious. He vomited. Pain was severe and situated in the left side of the abdomen. He walked home, but had to rest several times during a 15 minutes' walk. Pulse 116; no hæmaturia; abdomen distended and tender; percussion note dull on left side. Twelve hours after his injury he was operated on. The left kidney was exposed through a lumbar incision. A blue tense cyst presented and 4½ litres of frothy blood-stained fluid was removed by tapping. There was a rupture of the upper pole involving the peritoneum. Nephrectomy and repair of the torn peritoneum was followed by recovery.

10. E. W. Johannsen.—In this case the rupture appears to have occurred twice to the same kidney. A youth of 17 was dragged along the ground by the tethers of some sheep. Severe abdominal pain followed, and he was operated on at Hammel Hospital six hours later. At this operation the sigmoid and its mesentery were tightly stretched across a tense retroperitoneal cyst, which contained serous fluid and was then thought to be a lymphatic cyst. Three and a half years later he was crushed between a horse and its stable. He was admitted to Viborg Hospital. There was marked dullness on the left side. At operation there were dense peritoneal adhesions and a retroperitoneal collection of fluid. Nephrectomy was performed. The patient recovered. It was noted that he was a cryptorchid with ill-developed penis; cystoscopy was for this reason impossible.

11. Anthony H. Harrigan.—A girl of 10 fell on the edge of a soap-box. She was in a fainting condition for an hour. For two days she vomited repeatedly and was then brought to hospital. Abdomen slightly distended and rigid. Urine contained neither albumin, casts, nor cells. Leucocyte count 31,000, 77 per cent. polymorphs. Laparotomy; abdomen contained blood but no gross lesion; cystic mass in left renal region; wound closed. Nephrectomy was then performed in the usual way. Recovery was marked by a transient renal insufficiency. On discharge, renal function, estimated by the phenol-sulphone-phthalein method, showed 20 per cent. first, 25 per cent. second, and 7·5 per cent. third hour.

In addition to the case first reported, and to these 11 quoted above, Prof. Adolf Brentano reports of a tour de force, when dealing with such easily obtainable material. The disadvantages inherent in all quantitative micro-methods are by no means minimised by the author, and all who contemplate following his technique will do well to study carefully his "allgemeine Regeln" (p. 7). The methods of blood investigation are excellently chosen; they include procedures, mostly of proved value, for the estimation of practically all the constituents of the blood, including the gases, and also the method recently described by Michaelis for the estimation of the pH of serum and other fluids. The descriptions of technique throughout are models of clarity and conciseness.

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[1] Oehme, R.: Beitr. z. Klin. Chir., 1907, lii., 702.

[2] Schetelig: Archiv für Gyn., I., iii. Cantu: Gaz. Med. 1889, 17. Schede: Ehrfahrnungen über Nierenexstirpation, 99. Lampe: Inaug. Diss. Greifsw., 99. Dodge: Annals of Surgery, 1902, vi., 909. Suter: Beitr. z. Klin. Chir., xxvii., 354. Gaudiani: Riforma med. Palermo-Napoli, 1904, xx., 518; Deutsch. med. Wochenschr., 1904, No. 27. Rehn: In. Diss., Munchen, 1904. Johannsen, E. W.: Hospitalstidende, 1920, July 21st, 440. Harrigan, A. H.: Urologic and Cutaneous Review, May 5th, 1919.

The Anatomy of the Female Pelvis.

By F. A. MAGUIRE, D.S.O., M.B., Ch.M. Syd., F.R.C.S. Eng., Hon. Assistant Gynæcological Surgeon, Royal Prince Alfred Hospital, Sydney. Sydney: Angus and Robertson, Ltd. 1922. Pp. 115. 6s.

THIS little book is written by a clinician for clinicians, though its author is also a teacher of anatomy in the University. It gives the main facts of female pelvic anatomy shortly and clearly, and goes on to the examination of the organs during life, from the anatomical point of view. Its small size and easy arrangement will render it a serviceable book of reference for those who may find their knowledge of the parts at fault when dealing with some condition of disease in these regions.

A Manual of Human Anatomy for Dental Students.

By R. BRAMBLE GREEN, M.B., B.S. Lond., F.R.C.S. Eng. London: Benn Brothers, Ltd. 1923. Pp. 263. 18s.

THIS is a very good book on descriptive anatomy suitable for students of dentistry. It is divided into two parts, the first giving clear accounts of general anatomy, and of the skeleton and systems throughout the body in general. The second part is devoted to the regional anatomy of the head and neck. It is not a manual of dissection, but appears to sum up, in an intelligible and short way, all that it would seem necessary for the students to know. There is no attempt to deal with the teeth, on which there are special handbooks. The information contained in the book appears to be thoroughly reliable, except that in one place the author seems to suggest that the palatoglossus owes its innervation to the twelfth cranial nerve, on which point some might differ from him. The volume is well produced and printed in clear type, with useful illustrations.

Books for Nurses.

Surgical Nursing and After-Treatment.

Second edition. By H. C. RUTHERFORD DARLING, M.D., M.S. Lond., F.R.C.S. Eng., F.R.F.P.S. Glasg., Surgeon, Coast Hospital, Sydney, N.S.W.; Demonstrator of Anatomy, Sydney University. London: J. and A. Churchill. 1923. Pp. 566. 8s. 6*d*.

IN this portable volume Mr. Darling has condensed admirably all the knowledge that a nurse is expected to possess when called upon to undertake a surgical case. Given the practical experience that can only be obtained at the bedside, any nurse who knew all that this book contains would be able to undertake the nursing care of any surgical patient. Each chapter is preceded by a synopsis of its contents, which are then presented in a lucid and readable form. A number of illustrations add to the attractiveness of the book. It is divided into sections—namely, "General Surgical Nursing" and "Regional Surgical Nursing." In the first section short accounts are given of the pathology, symptoms, and treatment of the general surgical conditions commonly met with, including a glimpse into bacteriology and immunity. The general principles of asepsis, the arrangement of an operating theatre in hospital and in private practice, the treatment of hæmorrhage, infections, and fractures are dealt with adequately. It must be remembered that the book was written in Australia for Australian nurses, and that references to the South as an ideal aspect for an operating theatre must be translated into North for our latitude. The second section on regional surgery describes the preparation of the patient, the requirements of the surgeon, and the special after-treatment necessary for operations on the various organs of the body. A number of the modern improvements introduced during and since the war are included, and the book is thoroughly up to date. We hope that the book will meet with the success which is its due.

The Nursing of Infectious Diseases.

Third edition. By F. J. WOOLLACOTT, M.A., M.D., B.Ch. Oxon., D.P.H. London: The Scientific Press, Limited. Pp. 180. 4s.

THIS book, based on a course of lectures to nurses given by Dr. F. J. Woollacott, has been revised and brought up to date by Dr. Dorothy C. Hare. The chief additions relate to methods of investigation of infectious diseases both for diagnosis and infectivity, chapters on cerebro-spinal fever, tuberculosis, and venereal diseases having also been included. The subject of infection and the prevention and general management of infectious diseases is briefly but adequately discussed in the first three chapters of the book, after which follows a description of the chief infectious diseases of this country. Excellent judgment has everywhere been shown in the selection of points for discussion, and although it is assumed throughout that the reader has some acquaintance with the general principles of nursing, nothing relating specifically to the nursing of infectious diseases has been taken for granted. Some of the teaching given would hardly be endorsed by leading authorities at the present day.

In discussing the various plans adopted for preventing cross-infection the principles of barrier-nursing and bed isolation are described, but enough emphasis is hardly laid upon the fact that with the slightest neglect or carelessness on the part of a single nurse the whole system breaks down in that particular institution. Indeed, the experience of most authorities goes to show that even with the utmost care in technique bed isolation is not safe for measles or chicken-pox, or even, in Dr. W. Goodall's view, for severe cases of scarlet fever, diphtheria, or whooping-cough during the acute stage of the disease. These are small points, however; the book as a whole is admirably adapted for its purpose, and the new edition will be welcomed by nurses.

Text-book of Anatomy and Physiology.

For Training Schools and other Educational Institutions. By ELIZABETH R. BUNDY, M.D. Fifth edition, revised and enlarged by MARTHA TRACY, M.D., Dr.P.H., and GRACE WATSON, R.N. London: J. and A. Churchill. 1923. Pp. 442. 11s. 6*d*.

THIS little book was written as a text-book for those who were training for recognition as nurses, and includes an account of the human body from anatomical and physiological standpoints. The difficulty of producing enough and not too much, in writing for readers of this sort, is known to everyone who has attempted the task, and it is easy to be over-critical when dealing with the efforts of others. We can only claim, then, to express an individual opinion when we say that such things as the treatment of the palate bone as a separate entity, or the mention of nutrient foramina, however brief they may be, seem to be unnecessary; we rather think that, for nurses, certain parts and functions of the body might be treated with much more detail than is usually afforded, while of the rest some might be sketched in with broad outlines and others omitted altogether. The writers of this book do not see things in quite the same way, however, and the fact that the work has reached its fifth edition is perhaps sufficient justification for their faith.

Mr. F. F. WARD said he believed his failures in this condition had been due to the fact that he had washed out once only. He described one or two cases in which trouble ensued. The cannula he had been using was a lacrymal duct cannula. If at the injection of colloidal silver the patient complained of pain, that was an indication that the substance was actually in the vas. He would like to know whether the operation could be done in a fairly recent and acute case. He thought the operation was applicable far more often to cases which suffered from gonorrhœal arthritis.

Dr. DENNIS VINRACE said it was inadvisable to tell a patient with gonorrhœa that he was cured; a safer plan was to tell him to come for a further inspection after an interval; and if at the further interview his prostate was found to be enlarged, or his vesicles inflamed, he should be advised to have an operation. He hoped this operation would become a popular one, and that after the detailed description had been published more workers in venereal diseases would carry it out.

Mr. KIDD, in reply, said his object in bringing the communication forward was to popularise the operation. He had now been working at the matter for ten years, arriving at the present position after experiencing many difficulties. It was easy to cause the vas to slough if it were hung up; it was a simple procedure to ligature it. When operating on the bladder he often ligatured the vas, and nothing happened to the testicle. He hoped that those who essayed the operation would perform it on chronic cases, and follow his description of the operation in every detail. The colloidal silver he was using was one made specially for him at the Crookes Laboratory, and it was the best material for the purpose. Sometimes he used it in a 10 per cent. strength, very rarely indeed 20 per cent. His cannulas were made by Mr. J. H. Montague; it was essential to keep the wire in, otherwise there would be leakage into the needle, blocking it. He still emphasised the fact that there was a liability for iritis to recur after an interval of even years, and this was not the case with joint trouble after it had once been disposed of.

Reviews and Notices of Books.

CEREBRO-SPINAL FLUID IN HEALTH AND DISEASE.

By ABRAHAM LEVINSON, B.S., M.D., Associate in Pediatrics, Northwestern Medical School. London: Henry Kimpton. 1923. Pp. 267. 25s.

Dr. Levinson's book is already known in this country. In this, the second edition, he has added a good deal of new matter and brought the whole up to date. The result is a useful and thoroughly practical manual. Indeed, the author has rather tended to omit theoretical considerations in places where they might with advantage have been included. This is particularly the case when he deals with the newer diagnostic procedures, such as the colloidal gold and mastic reactions, depending upon alterations in the physical properties of the proteins of the cerebro-spinal fluid. His descriptions of the uses and interpretations of these tests is excellent, and his account of the technique quite sufficient to enable an intelligent worker to carry them out; he barely touches, however, upon the much-discussed mechanism of these phenomena.

A description of the technique of cistern puncture is given, and here the author might have gone more into detail. His advice is that no one should practise it without frequent preliminary trials on the dead body, and to do this avails more than the reading of scores of pages of instructions. No mention is made of the washing out of the spinal theca through needles inserted in the cervical and lumbar regions. Certainly the value of this procedure is doubtful, and it may be questioned whether it is ever justifiable, but it is for advice and information on just such points as this that the reader goes to books like Dr. Levinson's.

Froin's syndrome comes in for rather casual mention. To imply that it consists only in xanthochromasia and increased protein and cell content of the cerebro-spinal fluid is hardly to do justice to its originator. It is the presence of these phenomena in the fluid from one portion of the theca in conjunction with normal or more or less normal fluid higher up that constitutes the full syndrome; in practice, we admit, the presence of the normal fluid higher up is frequently taken for granted. The section on the anatomy of the ventricular systems and of the meninges is lucid and the illustrations good. The historical summary is excellent and makes interesting reading. A good many of the illustrations are unnecessary. Microphotographs of tubercle and other bacilli are not of much use to the sort of readers who are likely to resort to Dr. Levinson's pages, nor in fact to any one. It may be taken as axiomatic that even as in the dusk all cats are grey so in microphotographs all bacilli are alike.

BACTERIOLOGICAL DIAGNOSIS.

Leitfaden für die klinisch-bakteriologischen Kulturmethoden. Von Dr. HUGO SCHOTTMÜLLER, Professor und Direktor der medizinischen Poliklinik der Universität Hamburg. Berlin und Wien: Urban und Schwarzenberg. 1923. Pp. 96.

THIS handbook is intended as a guide to bacteriological diagnosis in a well-appointed clinical laboratory. The subject-matter dealt with is therefore rather restricted, and the greater part of the information which it contains is also to be found in more complete works on bacteriology. The methods which are recommended are well described, and they derive interest from the fact that they have been selected by one who has had large practical experience in the subject and has himself devised some of the technique. Sixty-eight of the 91 pages are devoted to blood culture, and both in this section and elsewhere especial attention is given to the streptococci, as is natural considering the association of Schottmüller's name with work on this group of bacteria. Some of the statements are more suggestive of finality in streptococcal classification than will be accepted as they stand by most other bacteriologists. For the "typhoid-coli" group of organisms the methods of diagnosis are, in accordance with German custom, rather unnecessarily complicated, especially as regards the use of various whey and nutrose media, which in this country are usually regarded as quite superfluous for routine diagnostic work. The simple and entirely satisfactory MacConkey's lactose bile-salt agar, on the other hand, is not mentioned. The omission of dulcitol, which is so useful in culture-media for the identification of the salmonella group, seems strange in a book written by the original sponsor of the paratyphoid bacilli. The book is very well and clearly printed, and contains a good index but very few references.

Mikromethodik: Quantitative Bestimmung der Harn- und Blutbestandteile in kleinen Mengen. Zweite Auflage. Von Dr. med. et phil. Ludwig Pincussen, Direktor der Biochemischen Abteilung des Städt Krankenhaus am Urban zu Berlin. Leipzig: Georg Thieme. 1923. S. 125. M.18.

IN this book, in the compass of 125 pages, the author brings together many of the more recently described micro-methods for quantitative investigation of the blood and also micro-methods worked out by himself for the estimation of the constituents of the urine. Micro-methods involving for the patient only a prick with a needle are of obvious advantage in dealing with the blood; in the case of the urine, however, their advantages hardly appear to outweigh their disadvantages; the use of only 0·1 c.cm. of urine for estimation of the nitrogen by a micro-Kjeldahl method and of 1 c.cm. for estimation of the chlorides by a micro-Volhard method seem rather in the nature

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(Continued from p. 190.)

REPRESENTATIVE MEETING.

MONDAY, JULY 23RD.

Financial Statement.

THE session opened with a financial statement by the Treasurer, Dr. G. E. HASLIP, for the year ending Dec. 31st, 1922. The income for this year amounted to £112,141, the expenditure to £102,337, with a surplus of £9804. The revenue from subscriptions amounted to £2 11*s.* 9*d.* per head of membership, which had been allotted as follows :—

	£	*s.*	*d.*
Central Association expenses	0	2	10
Central meeting expenses	0	8	4
Central premises expenses	0	3	8
Central printing, stationery and postage account	0	2	2
Central staff expenses	0	11	3
Library account	0	0	8
Journal account	0	7	3
Grant to Irish Committee	0	0	10
Grant to Scottish Committee	0	1	7
Capitation grants to branches	0	4	5
Subscriptions written off for deaths and in arrears	0	2	3
Depreciation, &c.	0	1	8
Surplus (part)	0	4	10
	£2	11	9

In pursuance of a decision of the Glasgow meeting, a separate reserve fund had been created, which now stood at £27,247, being entirely represented by first-class securities readily realisable. The combined reserve fund and surplus account amounted to £152,142. Expenditure, Dr. Haslip said, continued to increase year by year, and although a motion by Hastings invited the meeting to "view with alarm and regret" the continuous increase of central staff expenses, the meeting emphatically signified its approval. Dr. J. D'EWART made good the point that an Association which did not pay its own office staff properly could not go to the Government with a valid plea for an adequate capitation fee. A motion to reduce the annual subscription was withdrawn and a motion to reconsider it was lost.

Insurance of Editorial Staff against Libel.

A motion by Wandsworth and Blyth proposed that the Association would feel safer if it were protected by insurance against process for libel or slander against any of the editorial staff. Dr. HASLIP preferred to leave the responsibility on those who acted for the Association, asking what the effect on a jury would be of a question from counsel: "Is it a fact that your Association is insured against libel actions?" Dr. BOLAM thought that the proposal would involve insurance of every activity of the Association; the right remedy lay, he said, in "the care with which we order our actions." The motion was lost by a large majority.

Medical Benevolence.

The Treasurer alluded in his financial statement to the meagre contribution of members of the Association to medical benevolence; the Royal Medical Benevolent Fund had only benefited during the year to the extent of £837 (out of a subscription total of some £60,000). It was a lamentable fact that a mere 10 per cent. of the medical profession in the country and only 7 per cent. in London subscribed to the Fund. There was, however, this to be said: the medical charities offered no encouragement to the Association to assist them—and he gave specific examples of lost opportunities. The B.M.A., if asked for their help, could, said Dr. Haslip, easily double or treble the subscription list to the R.M.B.F. The meeting acquiesced in the statement that "the charitable funds are a disgrace to our profession," and left it at that.

The Association's New Home.

The Chairman of the B.M.A. Council and the Treasurer then reported briefly on the arrangements made to acquire new premises in Tavistock-square for the headquarters of the Association, figures being given of the accommodation in the new building and of the financial transactions in connexion with the purchase. Dr. BOLAM said that the building, designed by Sir Edwin Lutyens, and originally intended for a theosophical college, was during the war taken over for Government purposes, and came into the hands of the Disposals Board. The building as it existed would provide scope for all present activities; it contained a really noble hall which would hold the largest meeting the Association was ever likely to require, and more space for social purposes could be obtained by the acquirement of certain houses fronting on Tavistock-place. Dr. HASLIP, who described the new house as a "gift from the gods," showed in detail how the cost of acquiring the premises on a 200 years' lease could be met. Much enthusiasm prevailed in the meeting for the new venture. The CHAIRMAN broke his self-imposed silence to speak feelingly on the great opportunity afforded for the social work of the Association. Dr. J. A. MACDONALD congratulated the Council on their prescience and good skill in negotiation. Mr. BISHOP HARMAN suggested a Gate of Honour in memory of members who fell in the war. The suggestion was made, situated as it was in the neighbourhood of the new University of London, the house might become a centre of intellectual life and of organised post-graduate medical work in London.

Organisation of Colliery Surgeons.

As Chairman of the Medico-Political and Parliamentary Committee, Mr. E. B. TURNER proposed the adoption of a scheme for the organisation of colliery surgeons in England, suggesting the formation of special colliery and works surgeons' committees to deal with the domiciliary attendance upon persons on a contract basis, the Council of the B.M.A. to be the executive committee, and every surgeon in the area paying a special subscription of 5*s.* per annum towards expenses. The scheme upholds the principle of free choice of doctor and freedom from lay control, the method of payment to be left to local arrangement, contributions, where possible, being deducted at the colliery or works' office. This scheme was accepted after a brief discussion.

Medical Examination of Emigrants.

A recommendation by the Council that the fees chargeable by the medical referees appointed by the Dominions of the Empire to examine proposed emigrants should be 10*s.* 6*d.* per adult of the age of 16 years and over, and 2*s.* 6*d.* for each child, but that in no case should more than two children in each family be charged for, was accepted by the meeting.

State Recognition of Opticians.

A further recommendation by the Council in regard to opticians was accepted in the form:

> That any State recognition of sight testing by persons not possessed of a medical qualification would not be in the interest of the community, and ought to be opposed in the strongest possible manner, and that the Council be instructed to take action in accordance with this decision.

Fees at School and Child Welfare Clinics.

It was proposed by the Chairman of the Medico-Political and Parliamentary Committee that the following minimum fees for the treatment of school children and for treatment at maternity and child welfare clinics or centres by private practitioners be approved:—

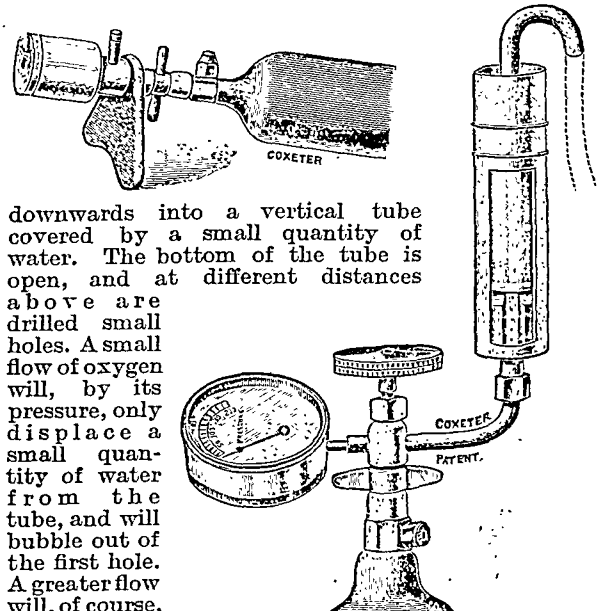
1. For the treatment of minor ailments, £1 11*s.* 6*d.* per session of not more than two hours, provided there is a limitation, to be agreed locally, of the average number of new cases to be seen in each session.
2. For ophthalmic work involving refractions, 10*s.* 6*d.* per case, or £2 12*s.* 6*d.* per session of not more than two hours, provided there is a limitation, to be agreed locally, of the average number of new cases to be seen in each session.
3. For adenoid and tonsil operations involving a general anæsthetic, a total fee for the two practitioners concerned of £1 11*s.* 6*d.* per case for less than four cases; *or* £5 5*s.* per session at which the average number of cases per session to be dealt with is agreed locally, such agreed number to be not more than eight.
4. For other operations on eye, nose, ear and throat cases a fee specially arranged in each case.

To assist the authors in preparing the sixth edition we may note the following points. Fig. 79 has a mistaken label for the rectus; the nerve supplies of buccinator, diaphragm, and one or two others would bear a little revision; such things as the rotating action of the psoas and the origin of the small pectoral muscle might also be reconsidered; it might, moreover, be well to harmonise the conception of the meaning of eversion and inversion of the foot with that more usually accepted. The work is well and clearly printed and produced, and is copiously illustrated, with many coloured figures.

New Inventions.

NEW PATTERN OXYGEN SIGHT-FEED VALVE.

THE illustrations show how, by means of a single piece of apparatus, the supply of oxygen to patients can easily be regulated and waste obviated. The tube and funnel method is not only wasteful but often defeats the object of its use, as usually the blood becomes saturated with oxygen, the H-ion concentration is decreased, and consequently the respiratory centre receives less stimulation than before, and the patient breathes more shallowly than ever. Oxygen should be given in such a way that it enriches, but does not displace, the air the patient breathes. This can be achieved most economically by means of the apparatus described herewith, the oxygen passing downwards into a vertical tube covered by a small quantity of water. The bottom of the tube is open, and at different distances above are drilled small holes. A small flow of oxygen will, by its pressure, only displace a small quantity of water from the tube, and will bubble out of the first hole. A greater flow will, of course, displace more water and bubble out of the second hole, and so on. In this way the physician can order the nurse to give the patient two, three, or four holes of oxygen as the case may be, instead of vaguely ordering the administration of oxygen. In order that the patient should get the full benefit of the small quantity of oxygen required, a nozzle is attached to the rubber tube, and by means of a spring clip in connexion with it, the nozzle can be fastened to the bedclothes in such a position that the flow of gas is directed towards the patient's nostrils or mouth, and as near as may be necessary, thus achieving the desired object of enriching the air the patient breathes.

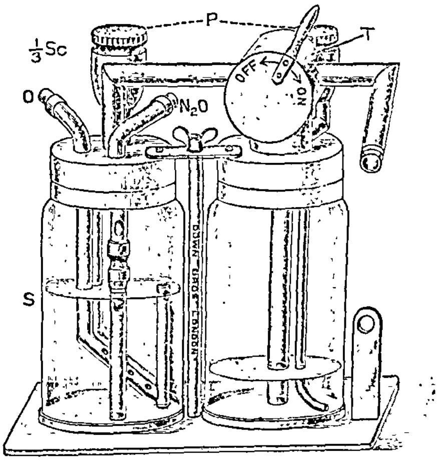


The apparatus is supplied in two forms by Messrs. Coxeter and Son, 171, Pancras-road, London, N.W. 1, one for use with upright cylinders and another for use with horizontal ones. In one form the apparatus consists of a pressure gauge and sight feed in one, ready for screwing into the cylinders, the gauge enabling one to see at a glance how much oxygen is available and the control of the gas taking place at the cylinder valve. In the second form an automatic pressure-reducing valve is provided for screwing into the cylinder, to which is connected, by a rubber tube, the sight feed part which is hung at the head of the bed, and the flow of the gas is controlled by a fine adjustment valve attached thereto, instead of on the cylinder.

F. P. DE CAUX, L.R.C.P. Lond., M.R.C.S.

AN APPARATUS FOR THE ADMINISTRATION OF NITROUS OXIDE, OXYGEN, AND ETHER.

THE apparatus here illustrated consists of two 8 oz. bottles fitted with screw tops and mounted on a metal base. The N_2O inlet to the water sight feed bottle (S) is made partly of metal and partly of glass, the metal part having a hole above the water-level equal to the calibre of the tube itself. When the N_2O is turned on the level of the water in the glass tube is depressed, such level indicating regularity of flow. A depression of ¾ in. represents approximately a flow of 120 gallons of N_2O per hour. The oblique construction of the oxygen tube (O) enables the bubbles to be plainly seen, and permits at the same time of a rapid and considerable increase in the volume of the oxygen without the risk of water being driven out of the bottle. Two "holes" of oxygen with a depression of ¾ in. in the N_2O tube represents 10 per cent. of oxygen. Both gases can be easily varied according to the requirements of the patient, and delivered under positive pressure if desired. The mixed gases can be diverted through ether, or C.E. mixture if preferred, by means of the two-way stopcock (T). The bottles can be filled or emptied through the plugs (P) without unscrewing the tops. On the assumption that a table of some kind is usually available for the anæsthetist, an elaborate stand or carrying case has been omitted from the design. The cylinders are mounted with fly nuts on a horizontal metal bar which is provided with two detachable legs. Long lever keys are used and the gas valves heated with a spirit lamp. Used in conjunction with a portable tracheal insufflation apparatus already described by me in THE LANCET,[1] and to which this unit can be easily attached, N_2O, oxygen, chloroform, and ether can be given by inhalation or insufflation as desired.



The original model of this apparatus was made for me by Messrs. Coxeter and Co., and the improved pattern by Messrs. Down Bros., St. Thomas's-street, S.E. 1.

I. W. MAGILL, M.B., B.Ch., B.A.O. Belf.,
Senior Anæsthetist, Queen's Hospital, Sidcup.

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[1] THE LANCET, 1921, i., 918.

ciation had no desire to enter into competition with any of the existing text-books of legal medicine.

A motion proposed by Dr. S. Noy Scott (Plymouth) seconded by Dr. A. Tennyson Smith (Bromley), and carried, emphasised the desirability that medical men called as witnesses in legal cases (especially under the Workmen's Compensation Act) should consult with each other before the case is heard so that they may, if possible, agree upon facts.

Election of Eight Members of Council.

The deputy medical secretary announced that the voting for the eight members of Council for the session 1923–24 had resulted in the election of the following: Dr. H. G. Dain, Dr. E. R. Fothergill, Dr. R. L. Langdon-Down, Dr. J. A. Macdonald, Dr. G. W. Miller, Dr. C. Sanders, Mr. H. S. Souttar, and Mr. E. B. Turner. The election was conducted on the single transferable vote principle, and a woman member was nominated but not elected.

Nursing at Cottage Hospitals.

Dr. J. McGregor-Robertson raised the question of the position of nurses in cottage hospitals not recognised as training centres by the General Nursing Council. The B.M.A. Council felt that it would be in the interests of the public and of the nurses themselves if the training in such hospitals were allowed to count in some proportion at least towards the statutory three years' training. Dr. E. J. Toye said it was a matter of life and death for cottage hospitals, for directly the nurses found out that such training and experience did not count towards obtaining the diploma they resigned.

Naval and Military.

The report of the B.M.A. Council under this heading was accepted and Colonel C. B. Heald, Major-General Sir William Macpherson, and Colonel Sir Walter J. Buchanan were appointed to the Council to represent the medical services of the R.A.F., A.M.S., and I.M.S. respectively. Sir Percy Bassett-Smith continues to represent the R.N.M.S. The B.M.A. Council had endeavoured unavailingly to reopen the question of the position of senior surgeon commanders, adversely affected by the 1919 regulations, and the meeting agreed that recently qualified medical practitioners should still be advised seriously to consider the disadvantages to which they are liable if they place their careers in the hands of the Admiralty.

Scotland and Ireland.

Reports were presented by Dr. John Stevens, chairman of the Scottish Committee, and by the chairman of the Irish Committee, and were approved. Dr. Stevens reported progress regarding the inquiries (1) into the results of gastro-enterostomy and gastrectomy, and (2) into puerperal sepsis.

TUESDAY, JULY 24TH.

Overseas Branches.

Sir Jenner Verrall, in the absence of Mr. T. P. Dunhill, moved the approval of this section of the annual report. The position of salaried officers in the Windward Isles remained most unsatisfactory, the medical services of the West Indies being the worst-paid of all the Colonial services, or, indeed, of any services over which the Crown had any control. The Colonial Office took the view that the financial difficulties of the West Indian Governments rendered the prospect of increased salaries unlikely in the extreme. Dr. John Hutson (Barbados), in thanking the Association for their work on behalf of the West Indian branch, pointed out that this reply of the Colonial Office was, unfortunately, perfectly true. Dr. G. B. Mason (Grenada) also agreed that the Government could not at present help the doctors. In regard to drastic action, he reminded the meeting that refusal of British doctors to go out to the islands would open the door to the employment of American doctors. Dr. E. P. Baumann (Witwatersrand) brought an assurance of goodwill from the South African members at a critical stage in the negotiations regarding a separate medical association.

Non-Panel Practitioners.

Dr. C. Buttar, chairman of the Non-Panel Committee, moved the approval of a brief section of the report dealing with non-panel work. The B.M.A. Council in April last appointed a Committee of members not engaged in National Health Insurance work—viz.: Dr. A. Blackhall-Morison (London), Dr. C. Buttar (London), Dr. H. Cook (Cardiff), Dr. J. Don (Newcastle-on-Tyne), Dr. J. Stevens (Edinburgh), Mr. E. B. Turner (London), and Mr. W. Webster (Newcastle-under-Lyme)—to consider in what manner the Association could best promote the interests of members who had not entered into agreements with insurance committees. The Council was not yet in a position to make any recommendations. Dr. Buttar said that the Committee had not found much work to do, for the panel man was fairly well satisfied, while the non-panel man still made a living. He desired to get rid of the idea that the interests of the Association were becoming wholly bound up with those of practitioners under the Insurance Acts, and he foresaw important questions arising for consideration in view of the possible extension of insurance practice to the families of insured persons and the re-definition of the scope of general practitioner service. He wished to make five points: 1. How was the future of non-panel men affected by the Insurance Acts? 2. The provisions of these Acts, while irksome to the panel man, were insupportable to the non-panel man, and prevented him from working under them. 3. The situation could only be met by a return to the conditions of private practice. 4. Proper application should be made of Section 15 (3) of the original Act. 5. Inquiry should be pressed into the working of the Insurance Acts, where working well, where badly, and what alternative system could be devised more generally acceptable to the profession and of equal value to the community. The report was accepted without comment.

Highlands and Islands.

It was pointed out by a representative of the Highlands and Islands of Scotland that the mileage subsidy from the Treasury had proved of enormous benefit during the past nine years in providing more efficient service for poor persons. The grant had been raised from 6*d.* to 9*d.* and then in 1920 to 1*s.* per mile run, but was still inadequate. Practitioners who derived four-fifths of their income from the Board of Health subsidy could hardly refuse service on instruction from the Insurance Acts Committee, and therefore asked leave to approach the Scottish Board of Health on their own account.

Notification of Venereal Disease.

A motion by Sir Jenner Verrall, chairman of the Special Committee *re* Notification of Venereal Diseases, for approval of the relevant section of the report, produced a counter-proposition by the Chichester and Worthing branch, "That this meeting objects to any system of compulsory notification of venereal diseases at present." Mr. E. B. Turner recited the results obtained in various parts of Canada from a graduated system of notification of those who prematurely discontinued treatment. Of 1762 patients warned in Toronto, it had only been necessary legally to proceed against 33. Any proposal for conditional modified notification should be preceded by education of the public by efficient treatment, especially at the hands of the general practitioner in rural areas, and by enforcement of legal action against quacks. Dr. McGregor-Robertson said that 40 to 60 per cent. of Scottish expenditure on venereal disease was wasted because treatment was not completed; they were not asking for notification but for some means of making effective the treatment of uncontrolled persons. It was resolved to leave the subject in the hands of the Council for further consideration.

Votes of Thanks.

On the proposal of the Chairman, the hearty thanks of the Representative Body were given to the following who contributed to the comfort, convenience, and

5. For the administration of anæsthetics, £2 12*s.* 6*d.* per session of not more than two hours, provided there is a limitation, to be agreed locally, of the average number of cases to be dealt with in each session.

6. For X ray treatment of ringworm, £3 3*s.* per completed case where the practitioner provides his own apparatus, or £2 2*s.* where the apparatus is provided by the local authority.

7. All the foregoing fees to be exclusive of any fee paid to institutions for maintenance or other attendance on patients.

8. Any local arrangement in terms varying from the above to be submitted to the Council for approval before being adopted.

After some discussion on the combined fee for tonsil operations the motion was carried.

Salaries of Part-time V.D. Appointments.

The scale of remuneration for part-time senior medical officers of clinics set up by the Representative Meeting of 1917, under schemes for the diagnosis and treatment of venereal diseases, was rescinded in favour of the following policy:—

That the minimum remuneration for part-time senior medical officers of clinics set up for the diagnosis and treatment of venereal diseases be *£1 1s. for the first hour or part* of an hour and 10*s.* 6*d.* for every additional half-hour or part thereof.

Municipal Clinics and Hospitals.

Endorsement was given by the meeting to the recommendations of a committee appointed to consider the general question of the relation of private practitioners to municipal clinics and hospitals, the following principles being laid down:—

The object of maternity and child welfare centres should be educational and advisory, and therefore preventive. No medical treatment should be given *at the centre as it is* against the best interests of the centres to encourage women to go there for what they can *get* rather than for what they can *learn.*

When the expectant or nursing mother or the child requires any medical treatment, *the procedure outlined* under medical treatment of school children should be followed. This would limit the patients to those who are unable to provide a family doctor for themselves or for their infants. Where treatment has to be provided by the *local authority* at a clinic, it should *preferably* be undertaken at the common clinic for all statutory purposes.

There may be advantages to the work in associating with the centres a body of voluntary workers, but the whole of the work should be under the control of the medical officer of health in order that all the *preventive agencies* may be coördinated.

The support of the local doctors, nurses and midwives *ought to be secured.* To effect this it is important (*a*) that it be made quite clear that the sphere of the centres is restricted as recommended above, and (*b*) that members of these professions be represented on the statutory committee and the committees controlling the centres, these representatives *being nominated* by the local organisations of these professions wherever such exist.

Medical Treatment of School Children.

The procedure mentioned above was laid down by the Association in 1916 as follows:—

(*a*) The medical treatment of school children is a great national undertaking, the ultimate success of which largely depends upon the number of persons who are interested. From this point of view it is better that as many as possible of the medical profession should have personal contact with the work, rather *than that familiarity* with it should be confined to a small class of public officials.

(*b*) Medical practitioners who are engaged in *private* practice enjoy the benefit of a wider experience of the treatment of disease in general than those whose work is confined to the treatment (*or the treatment* and inspection) of school children.

(*c*) Treatment and recurrent supervision of the school children by such practitioners, supplemented by the "following up" work of the school medical officer, in the opinion of the Association *alone give security* that the medical needs of the children will be adequately met.

(*d*) The treatment of diseases of children gives those who carry it out opportunities of obtaining valuable experience. If the work is done by private practitioners who are engaged, *apart from their* school work, in treating members of the general public, the general public derives great benefit from the greater efficiency of private practitioners generally.

(*e*) The employment of private practitioners gives the education authority *a much* wider field of choice than if the work is carried out by whole-time officers, and by the employment of part-time officers the authority would be able to adjust the appointment of persons of special skill to its *requirements.*

Midwives and Use of Opium and Pituitrin.

The meeting renewed the protest contained in the following resolution passed in 1922:—

That this meeting is of opinion that the practice of the use by *midwives* of opium (as well as of pituitary extract) is fraught with considerable danger, and considers that a continued protest should be made against such use.

Representations made to the Central Midwives Board and the Ministry of Health had evoked a statement from both bodies that there was no evidence that any harm had resulted from the use of opium by midwives. With regard to the use of pituitary extract by midwives, the Minister of Health recognised that this was a drug which should only be used by a midwife under the direction of a doctor.

Notification of Convictions to the G.M.C.

As the result of an emphatic letter to *The Lancet* and *British Medical Journal* of July 1st, 1922, in which Dr. J. M. Brennan, J.P., stated that he was not satisfied that trivial offences rightly came under the jurisdiction of the General Medical Council, the B.M.A. Council went into the matter and ascertained:

(*a*) That no similar system of notification of convictions of solicitors or barristers exists, although in a serious case coming before the courts affecting a barrister, the matter may be dealt with by the Benchers of his Inn of Court, and (*b*) that the procedure in the case of medical practitioners arose in the following manner: (i.) that in *1892* the Home Office was asked to report to the G.M.C. all convictions for felony; (ii.) that in 1906 the Home Office was asked to notify all cases in which fines were inflicted, *as well as those* in which registered practitioners were ordered to be imprisoned; (iii.) that in *1912,* in consequence of certain matters which came under its notice, the G.M.C. requested that all convictions of practitioners might be reported to it, in order that it might be in a position to fulfil the duty laid upon it by Section 29 of the Medical Act, 1858; and (iv.) that the jurisdiction of the *G.M.C.* which empowers them "if they see fit" to erase, follows upon the fact of conviction; it is not conditioned by the receipt of an official or other report.

These being the facts, the B.M.A. Council nevertheless satisfied itself that although the system was not free from theoretical objection, there was no evidence of hardship having arisen from the procedure.

Two amendments were offered to the meeting asking that the procedure should be further scrutinised. A representative of Marylebone complained that it was a hardship for medical men to be reported for trivial offences. Dr. F. G. RALPHS, J.P., *thought* it unnecessary to notify to the G.M.C. convictions such as for driving inadvertently without lights, and suggested making a distinction between summary (e.g., drunkenness) and indictable offences. Dr. D. A. SHEAHAN desired that doctors should be treated like barristers and solicitors, and *not like children.*

Sir JENNER VERRALL saw the difficulty of drawing the line anywhere. A medical man convicted of drunkenness in the course of his work should be reported; the case of barrister or solicitor was not parallel. Mr. TURNER stated that no proceedings would be taken on the information in any one of the small cases; for drunkenness it was only on a third notice that a warning was issued, and on a further repetition the offender was placed on probation for a year. But he felt strongly that it should not be left to the discretion of magistrates' clerks and chief constables which cases should be notified to the G.M.C.

The amendments were lost and the report of the B.M.A. Council accepted.

Medico-Legal Matters.

A resolution by Dr. CHRISTINE MURRELL instructing the B.M.A. Council to consider the desirability of publishing a Legal Handbook for Medical Practitioners was rejected, the feeling being general that the proposal would be difficult and costly to carry out; while the advice needed by the practitioner could be obtained when the need arose. The Assoin particular to the unhygienic conditions under which children of from 5–6 years of age used to work in the weaving of Persian rugs, and the late form of rickets which this induced, leading to knock-knee and a high degree of pelvic contraction in girls, necessitating Cæsarean section when they become mothers. Dr. Clement C. Chesterman, of the Baptist Missionary Society, Congo, spoke of the long-continued fight against parasitic diseases which menaced the existence of the population of tropical Africa.

Mr. C. P. Childe presided at a temperance breakfast given by Dame Sophia Wintz, as Vice-President of the National Temperance League in the Grand Jury Room at the Town Hall, on Thursday, July 26th. Colonel C. J. Bond, F.R.C.S., who gave an address, deprecated the tendency shown by the medical profession to be led by rather than to lead public opinion and national habit in the use of alcohol at any given period. Dame Wintz referred to the great work done in the Navy as the result of the efforts of the late Dame Agnes Weston with whom she had been associated for over 40 years.

Social Functions.

Over 1500 guests attended the President's reception at the Queen's Hotel, Southsea, on Tuesday evening, July 24th, which was a very brilliant affair. On the previous afternoon members of the Association attended in academic dress a special service at the old Parish Church of St. Thomas. The Portsmouth division of the Association gave an "At Home" on the Clarence Pier, Southsea, on Thursday evening, July 26th, when more than 1000 guests were received by Dr. and Mrs. Lockhart Stephens, and the Portsmouth Film Service depicted many phases of the Association meetings which had just taken place. The Mayor's Ball at the Portsmouth Town Hall, on Friday evening, July 27th, concluded the series of social functions. About 700 guests were invited and music was provided by Miss Sawyer's band, while Sir John Corke assisted the Mayor in the general direction. The Commander-in-Chief and a large number of civic dignitaries were present. The same evening there were a wind-up Carnival and Dance at the Esplanade Assembly Rooms, and during the afternoon Sir William and Lady Dupree gave a garden party at Craneswater, Southsea.

Excursions and Pleasure Trips.

At the invitation of the Winchester Division a large party motored to Winchester on Saturday, July 28th, and visited the Guildhall, Cathedral, and Winchester College. The Isle of Wight Division arranged an attractive excursion to the island, luncheon being served at Totland Bay and tea at the Royal Naval College, Osborne. Several afternoon parties were shown over the dockyard, visiting H.M.S. *Victory* and H.M.S. *Renown*. Visits were also arranged to Midhurst Sanatorium and to the Hayling Island Branch of the Treloar Cripples' Hospital.

Over 100 members of the Association visited the laboratory of Mr. J. F. Marshall, director of the Hayling Mosquito Control on Hayling Island. The visitors, who included many medical officers of health, were shown maps setting forth the work undertaken in the island and photographs of infected areas before and after draining, as well as tanks containing larvæ of various mosquito species, the life-history of which was demonstrated by Mr. Shute of the Ministry of Health. The salt-water mosquito, *Ochlerotatus detritus*, had been shown to be almost the sole cause of the local trouble, and by draining off stagnant pools of water left inside the sea walls in various parts of the island, the number of these pests was being steadily reduced.

EXHIBITION OF INSTRUMENTS AND DRUGS.

The exhibition of medical and surgical appliances, foods, drugs, and medical literature, was opened in the gymnasium of the Royal Naval Barracks, on Tuesday, July 24th, by Mr. C. P. Childe, as President-elect. Before declaring the exhibition open, the President-elect made a presentation to Commodore C. S. Townsend, R.N., in recognition of the valiant assistance rendered by officers and men of the Royal Naval Barracks in setting out the exhibition. This hall had never been lent before except for Service purposes. The presentation consisted of a fine silver ewer, one of a pair designed by Mr. John Flaxman, R.A., and produced by Mr. Josiah Wedgwood. Commodore Townsend, in reply, reproached the Association for its failing to find a cure for mal-de-mer, that most distressing malady of a sea-faring country. The exhibition was highly representative and well-arranged, part of the large room being set apart for luncheons and teas, a wireless programme being given at intervals. The exhibition remained open until Friday, July 27th, and was well attended throughout. An account of the exhibits will appear in a later issue.

The exhibitors held a Bohemian Concert at the Albert Hall on Friday evening, July 27th, when a number of the Hippodrome artistes took part. The exhibitors expressed their appreciation at the hospitality shown to them by the naval authorities and local medical profession, and a hearty welcome was extended to Mr. C. P. Childe, who was present at the concert.

ASSOCIATED CARDIAC CLINICS IN U.S.A.

THE Association for the Prevention and Relief of Heart Disease (370, Seventh-avenue, New York) has recently issued a pronouncement as to the requirements considered by its members to be essential for an ideal cardiac clinic. These requirements are briefly as follows:—

Medical Organisation.

Ward Service.—Hospital wards should be available for an initial study of each case admitted to the cardiac clinic, for such other investigation as is indicated, and for treatment of patients unable or too ill to receive proper care at home. The cardiac clinic should function as a return clinic for cardiac cases treated in the wards. (The standards referred to below presuppose a ward service in direct connexion with the clinics.) The cardiac clinic should operate as a special section of a general medical clinic to which it should offer aid in diagnosis and treatment. Some members of the staff of the cardiac clinic should have ward duties, and all members ward privileges, with encouragement to follow up cases admitted to wards.

Responsibility for Patients.—When a patient is enrolled in more than one special clinic (cardiac, syphilitic, &c), the responsibility for his proper care must be placed upon one of these clinics, preferably the clinic which provides for the most urgent need.

Staff.—The staff should be assigned definite hours for attendance in the clinic. The chief of clinic should be of rank corresponding at least to that of an assistant-attending physician to the hospital. He should be an internist or pediatrician, with a broad clinical training and a special knowledge of cardiac problems. He should be responsible for maintaining the medical standards, and should supervise diagnosis and treatment by juniors. The medical staff should be relieved, as far as possible, of all duties not directly concerned with diagnosis and treatment of patients. Trained assistants for performing the executive, social service, nursing, clerical and technical functions should be provided. Staff conferences, either of the cardiac clinical staff or of the entire medical staff, should be held at least once each month for the discussion of both ward and dispensary cases.

Social Service.

The *Social Service Section* of the associated out-patient clinics has formulated general standards of organisation and function of social service in clinics. Only certain special points are therefore included in their consideration of cardiac clinics.

Medical Social Worker.—The social service worker should be the clinic executive, and should see that all measures concerned with management of the patients are properly carried out. It has been found that one full-time worker cannot care properly for more than 100 active patients. She should be provided with sufficient professional, clerical, and lay assistants, and should be invited to attend staff conferences. There should be provision for privacy for her interviews with patients.

Space, Equipment, and Records.

There should be adequate room for waiting, examination, and for teaching purposes, where teaching is carried on; the services of modern X ray plant, an electrocardiographic laboratory, and a proper clinical laboratory should be pleasure of the members of the Representative Body and their ladies: The Mayor and Corporation of Portsmouth; Mr. Douglas Handley; the concert party at the ladies' dinner and the smoking concert, and especially Mr. L. Glanville; Mr. Taylor, manager of the Municipal College; Mr. A. W. Ward, borough surveyor, the Southampton Division of the British Medical Association; the Ladies' Committee; Mr. T. A. Munro Forde, chairman of the Dinner Committee; Dr. C. F. Routh, chairman of the Reception Committee; Mr. Bosworth Wright, chairman of the Entertainments Committee; Mr. C. A. S. Ridout, the local general secretary.

On the proposal of Dr. T. W. H. GARSTANG, a previous chairman of the Representative Meeting, a hearty and grateful vote of thanks was tendered to Dr. WALLACE HENRY for his conduct of the meeting.

ANNUAL GENERAL MEETING, TUESDAY, JULY 24TH.

The formal meeting was held at 2 P.M. in the Municipal College, when Mr. C. P. Childe, F.R.C.S., was inducted as President by Sir William Macewen, retiring President. After transacting the statutory business, the meeting adjourned until 8 P.M. in the Town Hall, when Mr. Childe delivered the Presidential address entitled "Environment and Health," which appeared in substantial abstract in our last issue. The President was supported by the Mayor, Alderman F. G. Foster, J.P., Admiral Sir Sidney Fremantle, the Bishop of Winchester, and the executive officers of the Association. In proposing a vote of thanks, Dr. R. Wallace Henry spoke of the address as one in which research and philosophy had been duly blended. There were, he was glad to note, five medical men showing a keen interest in civic affairs by their work on the Portsmouth Town Council. The Bishop of Winchester, who seconded, said that nothing was more important to the welfare of the community than the right mutual relations of the members of the different professions to the places in which they lived. The Mayor, in supporting the vote of thanks, observed that as an ancient borough they had received a legacy of slums which Mr. Childe, as chairman of the Health and Housing Committee, was doing his best to ameliorate.

FUNCTIONS AND FESTIVITIES.

The Annual Dinner.

The annual dinner of the Association took place in the Town Hall on Thursday evening, July 26th. Mr. C. P. Childe, President of the Association, presided, and was supported by the Mayor (Alderman F. G. Foster, J.P.), the Admiral-Superintendent (Rear-Admiral Sir Percy Grant), Colonel Sir Arthur Holbrook, M.P., Captain Walter Elliott, M.P., Sir William Dupree, Sir Harold Pink, J.P., Captain Colin Maclean, and the Rev. W. H. David, vicar of Portsmouth. The toast of "The Imperial Forces" was given by Sir William Macewen, the retiring President of the Association, who expressed his belief that universal manhood training for a year or more during a suitable age would be a good thing for the physique of the nation, while all women should be trained to suitable avocations for the purpose of understanding what war might mean if it came. Sir Percy Grant, Lieut.-Colonel C. W. Mainprise, Wing-Commander R. J. Bone, and Sir William Dupree responded. The toast of "The Mayor and Corporation of Portsmouth" was given by Captain Walter Elliott in a brilliant and amusing speech. There was, he said, no such tyranny in the world as that practised in the sick room by the medical man; and when he was confronted with the spectacle of modern legislature he was apt to treat it with impatience if not contempt. One of the most urgent tasks before the country was the restoration of the local administration which had once been its great pride. The qualities of hospitality, initiative, and self-government in the best sense of the word had, he said, always characterised the town of Portsmouth. Alderman Foster, in replying, expressed his pleasure at having had the opportunity of welcoming the Association on behalf of the corporation. At this point trophies played for on the golf course at Hayling Island earlier in the day were presented—namely, the Ulster Cup to Dr. T. B. Jobson (handicap 9, 4 up on bogey) and the Childe Cup to Dr. J. Kyffin (handicap 18, 3 up on bogey). The toast of "The British Medical Association" was given by Sir Arthur Holbrook, who said the country was appreciating the efforts made by the medical profession to eradicate disease and promote new methods of treatment. Dr. R. A. Bolam, chairman of the B.M.A. Council, and Sir Joseph Verco (Adelaide) responded, the latter voicing the loyalty of the Australian branches. Dr. T. A. Munro Forde proposed "Our Guests," Sir Harold Pink and Prof. A. D. Blackader (Montreal) responding. On the invitation of Sir Jenner Verrall, "The Health of the President" was then drunk with musical honours. During dinner an admirable programme of music was rendered by the band of the Royal Marine Artillery.

Visits to Hospitals.

The chairman of the Royal Portsmouth Hospital Alderman Charles Dye, gave a reception at the hospital on Thursday, July 26th, when he briefly recited the history of the institution on which £34,000 had recently been expended. In 1902 the operations performed on in-patients numbered 531, in 1922 they had increased to 1872; while the population of the town had increased only 25 per cent., the hospital work was more than doubled and the number of operations had trebled. He was a firm adherent of the voluntary principle, free from State or municipal interference.

About 50 members of the Association attended at the Portsmouth and Southern Counties Eye and Ear Hospital on the same afternoon, when cases were shown by Dr. W. S. Inman and Mr. C. A. Scott Ridout, visitors being entertained to tea by the chairman of the hospital, Mr. Henry Dummer.

A party of 200 doctors and friends paid a visit to the Royal Naval Hospital, Haslar, on Friday afternoon, July 27th, when Major Meurice Sinclair, R.A.M.C., gave a demonstration on the treatment of fractures and on a mobile X ray plant. Most of the apparatus in the up-to-date massage department had been presented by the children of the Johannesburg and Rand schools as a war-time gift to the Navy in 1916. Music was supplied by the Commander-in-Chief's band.

Popular Lecture.

A popular address was given on Friday evening, July 27th, by Captain Walter Elliott, Parliamentary Under Secretary of Health for Scotland, on "Assimilation, or Food and Health," Dr. C. F. Routh presiding. Dr. Elliott's main thesis was that tissue-builders must not be neglected by reason of the belief that energy-yielders are the more essential, and he called attention to the liability of manufactured foods brought from long distances to be deficient in some of the elements vital to the body.

Breakfasts.

About 100 guests were present at a Medical Missionary breakfast, the first of its kind, held in the Queen's Hotel, Southsea, on Wednesday, July 25th. Dr. Mary Scharlieb was in the chair, supported by the Bishop of Winchester, Bishop Ingham, and Mr. C. P. Childe. Dr. Duncan Whyte, of Swatow, China, conveyed the greetings of the China Medical Missionary Association and explained its work. Dr. Scharlieb gave a brief address of welcome; she found it hard to understand why Christian members of the medical profession did not take a deeper interest in missionary work. Dr. G. E. Dodson, of the C.M.S., Persia, gave a description of missionary work in Central Persia, where he had been stationed since 1903. Prejudice and intolerance were giving way to a sincere appreciation of the work of the mission. He referred

THE LANCET.

LONDON: SATURDAY, AUGUST 4, 1923.

LOCAL HEALTH ADMINISTRATION.

SPEAKING at the annual banquet of the British Medical Association last week, Captain WALTER ELLIOT said that one of the great tasks of Britain now was to restore local administration, once the pride of this island. The peculiar qualities of the English, the Scottish Secretary added, might be best seen in the genius they displayed in getting other people to work for them. The issue of the report by consultative councils of the Scottish Board of Health on a reformed local authority for health and public assistance [1] is a reminder that although an English Ministry and a Scottish Board of Health have been formed, unifying to a certain extent central administration, local public health administration remains in an unsettled condition. The necessity for reform was made manifest by the reports of the Royal Commission on the Poor Laws. Both minority and majority reports of this Commission recommended abolition of the boards of guardians, and had there not been disagreement on important points of detail the subsequent history of public health insurance in this country might have differed greatly from the actual course of events. By means of the Maclean Committee a *modus vivendi* between these reports was agreed upon, but although promises were made of action in the direction of the report of this Committee, little yet has been done of which the public know. The report of this Scottish Committee may, it is hoped, bring the problem once more within the range of practical politics, and Scotland, as has happened not infrequently in the past, may show England the way to more efficient and therefore more economical public health administration. But it must be remembered that the difficulties in England are immeasurably larger, because of the numbers concerned, and the complexities left by previous good and pioneer work.

The two main needs for reform, as stated in the report, are exemplified as fully in English as in Scottish local authorities. There is overlapping and waste, due to the distribution of the local administration of the health services among several different authorities in each area, and many of the administrative units are too small to carry out efficiently the powers and duties laid on them by Parliament. The drastic character of the recommendations of this Consultative Council may be gathered from the fact that their proposals would eliminate for the major purposes of health administration 98 district committees and 194 out of 201 boroughs having a population of less than 50,000, while 869 parish councils and 27 district boards of control would cease altogether. It is very properly pointed out that so far from these proposals interfering with local administrative autonomy, more representative and more powerful local authorities would be created, justifying greater freedom in the exercise of their functions. Evidently these proposals cannot be carried out without opposition. Every small local authority has a vested interest in continued existence, though Parliament should be strong enough to resist the pressure of opinion inimical to reform. The transfer of the work of local insurance committees to committees of the new authority implies a change in the original plan of the National Insurance (Health) Act, removing the redundant insurance committees while arranging for the coöption on the insurance committee of the local authority of members of bodies specially interested in this work. The proposed transfer of the functions of parish councils to the county councils and town councils will simplify considerably the work of public assistance and eliminate much of the overlapping of public health and Poor-law work which now exists.

The medical profession are much concerned in the reforms proposed in this report. It is greatly to their advantage and much more so of their patients that relationships with official bodies should be simplified, that official medical work should be more accurately defined, whether parochial or insurance work or public health work proper, and that medical men and their organisations should be able to approach a single authority competent to deal with all the branches of work in which the medical profession are specially concerned. Here and there, no doubt, a forceful and tactful personality makes up for the shortcomings of a bad system: in one place, as at Portsmouth, a local hospital surgeon is chairman of the health committee; in another, a general practitioner presides over the insurance committee; in a third, the medical officer of health is the pivot of all the health activities of the sanitary area. But mind cannot so triumph everywhere over recalcitrant matter, and a remodelling of the framework of public health is a first necessity for a community that desires medical knowledge and experience to be translated into the elements of healthier living. We know that the Ministry of Health is making headway, but we have a feeling that the problems entailed by the centralisation of such great and varied activities are not appreciated by our readers—and certainly not by the public.

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PRECIPITATION TESTS FOR SYPHILIS.

FAIRLY soon after the introduction of the *Wassermann test*, in the endeavour to elucidate its mechanism and as part of the controversy which arose as to its nature, it became apparent that out of a mass of work the general fact was emerging that under many conditions *syphilitic* sera would give precipitates more readily than would normal sera. The possibilities of this fact are considerable. Though one of the most trustworthy of all clinical-pathological diagnostic measures, the Wassermann test contains a large number of variable factors, which must be carefully adjusted to render results of constant accuracy. The test consists of two parts. In the first the syphilitic serum and antigen are brought together in the presence of complement, and in the second the existence, or disappearance, of this complement is sought for by adding blood corpuscles and the appropriate specific hæmolytic serum. We hold the view that the essential of the test is the production of a precipitate between the syphilitic serum and the antigen, which is a colloidal suspension of lipoid particles. In the presence of syphilitic serum the physical state of this colloid differs in an only partially available. Records of history, physical examination, laboratory investigation, treatment, and follow-up notes, including social service activities, should be kept and filed in a manner meeting the approval of the Association.

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[1] Reports by Consultative Councils on a Reformed Local Authority for Health and Public Assistance, price 1s. 3d.

Admission and Distribution of Patients.

It is advisable, so far as possible, to limit the use of the clinic to patients residing within a specified district, and to limit its efforts to such numbers as may receive the best care, rather than to dissipate limited facilities upon numbers large enough to make the care inadequate. The patient should be treated by the same physician continuously, interviewed by pre-arranged appointment, and be made to understand that they may visit the clinic before the time of the appointment if they feel it necessary to do so. Only patients having potential or organic heart disease should be enrolled in a cardiac clinic, although any patient may be kept under observation until diagnosis is established. No patient's name should appear on the active list of the clinic if the patient has not attended within six months.

Standards: Examination and Treatment.—Each patient should have a complete physical examination on admission and receive such examination as is necessary on subsequent visits. All doubtful or unusual cases should be seen by the chief of clinic or consulting physician. All cardiac patients should remain permanently under the care of the clinic, even if free from symptoms. There should be at least one physician for every 50 active patients enrolled in the cardiac clinic. Patients should receive instruction list, diet lists, &c., in addition to verbal directions. The amount of medicine dispensed should be sufficient to obviate the return of patients for medicine only. Close coöperation should be maintained with the agencies providing convalescent and country care, and with schools, social agencies, day nurseries, &c. There should be facilities for consultation in all required specialties. It is recommended that a hospital for chronic cardiac disease be available to care for patients in need of prolonged hospitalisation.

Diagnosis of Circulatory Diseases.

Each diagnosis to be complete should include one or more titles from each of the groups, A,* B, C, D. Groups E and F, of course, demand nothing but ætiology.

A. *Ætiology.*—(1) Unknown; (2) "rheumatic": acute rheumatic fever, chorea, growing pains, tonsillitis, pharyngitis, others, as purpura, and erythema nodosum, &c.; (3) syphilitic*; (4) bacterial* (specify bacterium if possible); (5) thyroid*; (6) toxic: bacterial, mineral, and vegetable (specify if possible); (7) neurogenic; (8) general systemic disease (specify the disease—e.g., general arterio-sclerosis); (9) traumatic.

B. *Structure.*—(1) Atrophy of heart; (2) enlargement of heart; (3) hypertrophy of heart; (4) cardiac infarction; (5) rupture of heart; (6) cardiac thrombosis: (*a*) auricle, (*b*) ventricle; (7) myocarditis, acute; (8) myocarditis, chronic fibrous; (9) fatty infiltration; (10) fatty degeneration; (11) tumour of heart; (12) endocarditis: acute, chronic; (13) cardiac valvular disease, aortic insufficiency, aortic stenosis, mitral insufficiency, mitral stenosis, pulmonic stenosis, tricuspid stenosis; (14) congenital abnormality (specify lesion if possible); (15) pericarditis: acute, fibrinous with effusion, pneumo-pericardium; (16) adherent pericardium; (17) pericardial effusion; (18) tumour of pericardium; (19) aortitis: without dilatation, with dilatation; (20) aneurysm (specify affected vessel or heart); (21) embolism (specify affected vessel); (22) thrombosis (specify affected vessel); (23) arterio-sclerosis, general; (24) arterio-sclerosis (specify locality as, coronary arteries, cerebral arteries, &c.); (25) arteritis (specify locality); (26) periarteritis (specify locality); (27) no circulatory disease; (28) no cardiac disease; (29) undiagnosed.

C. *Pathological Physiology.*—(1) Regular sinus rhythm; (2) vagal arrhythmia: sinus arrhythmia, sino-auricular block, simple bradycardia, ventricular escape; (3) premature contraction: auricular, nodal, ventricular; (4) simple tachycardia; (5) paroxysmal tachycardia: auricular, nodal, ventricular; (6) auricular flutter: paroxysmal, chronic; (7) auricular fibrillation: paroxysmal, chronic; (8) auriculo-ventricular heart-block: partial block, (*a*) prolonged conduction time, (*b*) dropped beats, complete block; (9) intraventricular block; (10) neuro-circulatory asthenia; (11) valvular incompetency: mitral, tricuspid, pulmonic, or aortic insufficiency; (12) hypertension.

D. *Functional Capacity.*—(1) Patients with organic disease able to carry on ordinary physical activity; (2) patients with organic disease, with (*a*) activity slightly limited, (*b*) activity greatly limited; (3) patients with organic disease unable to carry on any physical activity—i.e., who must remain in bed or in a chair.

E. *Patients with Abnormal Signs and Symptoms.*—Not believed to be due to organic disease: this diagnosis to be "not cardiac—Class E."

F. *Potential Disease.*—Patients without circulatory disease whom it is advisable to follow because of presence or history of an ætiological factor.

Remarks.

The importance of preventive measures in the treatment of heart disease is well recognised; but, in order that such measures may achieve the best results, coördination is essential. Such coördination is the aim of the Association for Cardiac Clinics. Uniformity in diagnosis and treatment in different clinics would, in a short space of time, provide a mass of material capable of yielding valuable information, and so help to hasten the advance of knowledge concerning different cardiac conditions. Both "ideal" and "minimal" requirements are outlined in the present scheme. These, no doubt, may subsequently be found to require modification; for any scheme, however perfect in theory, can generally be improved as the result of experience in practice. Proper stress is laid on the importance of coöperation between the clinics and hospitals, and on the limitation in efficiency imposed by excessive numbers of patients at individual clinics.

In the matter of diagnosis, the scheme presents several important features. The grading of "functional capacity" is eminently practical, the "pathological physiology" can be determined with certainty; but, when one comes to ætiology, the classification is much more difficult. There are, for example, many cases of heart disease which would be labelled by one physician "rheumatic," and by another "of unknown origin." The latter may be an observer no less competent than the former, but he may feel that the evidence is insufficient to justify such a definite conclusion. Unless, therefore, uncontrovertible evidence be available, it would appear that the advancement of knowledge can best be attained if the temptation to attach a definite ætiological title be avoided, and if a considerable percentage of cases be allowed to remain, temporarily at any rate, in the group of "unknown origin."

DONATIONS AND BEQUESTS.—The late Mr. Alfred William Thomas Bean left by will £1000 to the Cottage Hospital, Bexley Heath; £100 each to St. Mary's Hospital, Paddington, Queen Charlotte's Lying-in Hospital, the Consumption Hospital, Brompton, the Hospital for Sick Children, Great Ormond-street, and the Paddington Green Children's Hospital; and £50 each to the Society for the Prevention of Cruelty to Animals and the Society for the Prevention of Cruelty to Children.—By will the late Alderman Francis Day Veasey, of Huntingdon, left £1000 to the Huntingdon County Hospital.—During the past month the Manchester Children's Hospital has received sums totalling £2084, which includes £1000 from the Heath House Orphanage for the endowment of a cot, £225 legacy from the late Mrs. E. Shufflebotham, and £572 from the joint committee of the Manchester and Salford Hospital and Saturday Funds.—The late Sir John William Kelk, London and Thetford, left by will among other bequests £1000 each to St. Mary's Hospital, Paddington, the Middlesex Hospital, and St. John's Hospital for Diseases of the Skin, Leicester-square.—The late Colonel John Goode Johnson, of Stockport, bequeathed £1000 to Stockport Infirmary and £100 each to the Stockport Institute for the Blind, Deaf and Dumb, Ragged and Industrial School, and Sick Poor Nursing Association.—During the past month the St. Mary's Hospitals, Manchester, received £236 in donations. Local and other hospitals benefited to the amount of £500, the proceeds of the Manchester county police sports. As a result of the Rochdale county police sports £1095 will be distributed to Oldham, Rochdale and district charities and police institutions.—By the will of the late Mr. John Black, of Toxteth Park, Liverpool, the charities of this city will benefit to the extent of £15,000; among the bequests are £1500 to the Liverpool Royal Infirmary, and £1000 each to the Royal Southern Hospital, David Lewis Northern Hospital, Children's Infirmary, Myrtle-street, Hospital for Consumption and Diseases of Chest, Stanley Hospital, and Seamen's Orphanage.

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[*] In the case of each of these conditions, it should be noted whether the ætiological factor is still *active* or is *inactive*—e.g., (A) Active syphilitic. (B) Aortitis with dilatation, aneurysm of ascending aorta. (C) Regular sinus rhythm. (D) Class II.a; or (A) Inactive rheumatic (acute rheumatic fever). (B) Valvular disease, mitral insufficiency, mitral stenosis. (C) Auricular fibrillation. (D) Class II.b.

the whiteness of the old Navy's decks, were seated motionless a large squad of sturdy young seamen, who were later to demonstrate the work of the school in which they are undergoing the six months' course for instructors. The Commander-in-Chief having arrived, Sir PERCY BASSETT-SMITH voiced the pleasure and gratitude of the Association at being invited to the demonstration. Surgeon-Commander K. DIGBY BELL explained the purposes of (*a*) physical training, to develop the recruit, teach him discipline, and make him anxious for more training; (*b*) physical exercise, to make him thereafter ever more and more fit; and (*c*) recreational training, to encourage the team spirit and develop alertness and other desirable qualities. Then were shown, first free standing exercises to show the gradually increasing severity of the practices, and the systematic attention paid to the equal use of all the muscular systems; these together teach a man to think and to strengthen his body, and are followed by activity exercises which make him supple. This is a school for instructors, and their teaching, and the teaching of judges and referees, were explained and then illustrated by a sabre *v.* sabre combat, and an exhibition boxing match, in which the combatants successively and by order did all the horridest things, as kidney and rabbit punches, and got freely knocked down, according to plan. Surgeon-Commander DIGBY BELL being here replaced as lecturer by a lieutenant-commander, clever and daring exhibition work was shown on the horizontal and parallel bars, and on the horse, this last without any spring board. Two instructors showed how men were taught in self-defence training to fall safely, by falling protectively, not on their bones, but on the muscles between the joints, and they illustrated how skilfully an opponent, even when attacking with a knife, could be countered and overset by an expert. Then the recreational games were shown, many of them. A ship is small, and has many men; they must take little room. They are extremely exciting, very popular, and no one is a good instructor who cannot invent a new game or make his squad interested in an old friend. Thus, two squads, "red" and "green," each of ten men, competed against one another; while the "reds" tossed a ball from one to the other round an inner circle, "green" with eager feet were running a relay race round them, and the instructor announced that simultaneously "red" had made 105 catches. Then "red" raced like mad round the catching "green" who, alas! owing to a dropped catch, and time so wasted, only scored 88 catches in their period. One expected that he who missed heard a good deal afterwards about his mistake, and would be very effectively stimulated to do better next time, and that is the object of these games, to strengthen the team spirit and secure accuracy of effort. After the gymnasium the swimming-bath, whose milky-blue water evidenced its careful disinfection: here swimming training and pretty diving off trapezes brought the demonstration to a close. The thanks of the visitors to the Navy was expressed gracefully to the Commander-in-Chief by Dr. LOCKHART STEPHENS, the Vice-President of the Southern Division, and the officers of the Naval Barracks (H.M.S. *Victory*) then kindly entertained the party at tea after a most interesting two hours which showed what great use was now being made by the Navy of its capable medical officers in the training of the Service, educating the personnel to keep themselves always in the best of physical condition, and ready to deal whatever may be before them of unforeseen, unimagined conflicts and emergencies.

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THE LANCET CENTENARY DINNER.

THE dinner in celebration of the completion of the hundredth year of THE LANCET will be held at the Hotel Victoria, Northumberland-avenue, London, W.C., on Thursday, Nov. 29th, 1923, and not as previously announced on Nov. 28th. Mr. Neville Chamberlain, the Minister of Health, has signified his intention to be present.

Annotations.

"Ne quid nimis."

NATURAL AND ARTIFICIAL SUN CURE IN TUBERCULOSIS OF THE LUNGS.

THE brilliant results obtained by intensive sun treatment in so-called surgical tuberculosis not only at high altitudes, but also in low-lying districts, have for many years been recorded: but the results on tuberculosis of the lungs have been, in many hands, disappointing, and have led to avoidance of the treatment by many physicians, and even to its condemnation by some as a dangerous and unjustifiable form of therapy. Dr. Johannes Schürer,[1] of Mülheim, combats this idea as a false one, maintaining that the action of the sun is not only on the diseased organ or part, but mainly on the whole body. The old tradition that direct sunlight is dangerous in cases of phthisis still holds sway in the minds of the majority of the medical profession, in spite of the fact that Finsen reported good results 20 years ago, and that in 1903 Nizza used the sun cure methodically, and demonstrated that the sunlight stimulated the nervous system, producing dilatation of the blood-vessels, lowering the blood pressure, and favouring the healing of the foci in the lungs. In the sanatorium treatment developed during the last 50 years, the action of direct sunlight plays no part, and no provision is made for it in the vast majority of sanatoriums. In 1921 Hoffner[2] wrote: ". . . . it was attempted to make the sun the cure for phthisis. The experience of all observers was, however, that the effect was harmful. . . . Existing latent processes became active," and he expressed the opinion that in every condition of tuberculosis of the lungs sunbaths were to be avoided. Bacmeister[3] came to the same conclusion, stating that "the most dangerous is the simple lying in the sun in the first tempting days of spring, or after a long period of dull weather. Each year a number of patients come to me who in this way have developed new foci, pleurisy, hæmoptysis, and other complications." Koch[4] reports similar cases of sunbaths undertaken by the patient without medical supervision resulting in a rise of temperature, increased cough, and hæmoptysis.

Nevertheless it would be a great mistake to confuse such unsupervised, unsystematic, and over-dosed sunbaths with a true sun treatment. Dr. Schürer points out that spontaneous self-treatment gives the effect rather of a "sunburn," and that good effects can only be obtained by means of exact medical observation and supervision. His own experience has been mostly on phthisical patients with well-marked lesions, too severe to be sent to the outlying country sanatoriums. The sunbaths were taken on the roof of the Evangelisches Krankenhaus in Mülheim, sheltered on two sides from wind currents. The roof of any town hospital might well be put to such use, and has the additional advantage of getting the sun at all times of the day, and of not being overlooked by other buildings, two objections to most verandas. The only cases which were not given heliotherapy were those with marked cachexia and high fever, those who were too weak to wash themselves, and those with large cavernous or pneumonic processes. On the other hand, hæmoptysis was not considered a contra-indication. In every case the patient was slowly acclimatised to the sunshine, starting with five minutes, with the legs only exposed, and slowly increasing daily with exposure of the arms and chest until in 12 days a complete sunbath of an hour's duration was allowed. In 24 days two hours were reached, and in some cases three hours, the time of the day chosen, and the length of the treatment ultimately depending on the weather and on the time of the year. It is known fashion from its state in the presence of normal serum, and in the former case it is particularly favourable to the adsorption and inactivation of complement, which thus disappears from the mixture so far as its subsequent demonstration is concerned. It is therefore obvious that if we could detect this alteration in the antigen visually we should be able to dispense with complement, hæmolysin, and blood cells, all variable factors, and not only simplify the test but probably render it more accurate. This is the end striven for by precipitation tests, which were first popularised in practicable form by SACHS and GEORGI and have since been modified in various directions by others. The essential question which remains to be answered, assuming the above theoretical explanations to be correct, is: Is the visual method as delicate a one for detecting the formation of a precipitate between serum and antigen as is the fixation of complement? This is the main point of interest in comparisons of the two tests, such as those we recently published. It is an important point since upon its answer will depend the form of the serum test for syphilis which should be adopted in the immediate future. In this connexion we would point out that it is already abundantly proven that a strongly positive Wassermann reaction corresponds, for all practical purposes, to a strongly positive precipitation test, but that in both cases the shading-off from the positive into the negative is not an abrupt process. Research therefore should be directed not only to the finding of conditions which will magnify the positive reaction and minimise such change as occurs in negative cases, but towards the weakly positive, the evolving, and declining cases. Comparison of the two tests with the clinical condition, which must always be closely watched, will yield information of the most value as to their relative merit.

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[1] Deutsch. med. Wochens., June 1st, 1923.
[2] Strahler-Ther., 1921, xii., 819.
[3] Zschr. f. ärztl. Fortbild., 1921, xviii., 284.
[4] Strahler-Ther., 1922, xiii., 134.

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PUBLICATIONS WHICH "TEND TO DEPRAVE."

A FEW days ago in the Court of Appeal Mrs. MARIE STOPES succeeded in obtaining the fruits of her libel action against Dr. H. SUTHERLAND and his publishers. There is no occasion now to reopen the controversy over what is popularly known as birth control; the views of both sides were sufficiently expounded at the original trial by witnesses of considerable weight and known sincerity. Nor is there any need to comment on this unfortunate litigation wherein, when the jury had duly answered the questions submitted to it, what should have been the end of the case proved to be merely the starting-point for fresh legal argument. The controversy, however, bore indirectly upon a point of some interest—namely, the immunity of technical publications from the criminal law as to the publication of matters obscene or indecent. Dr. SUTHERLAND had *inter alia* written of certain of Mrs. STOPES's publications the remark that "CHARLES BRADLAUGH was condemned to jail for a less serious crime." The comparison is a reminder of the change in public standards over the period of half a century. To publish any obscene or immoral book is a criminal offence—a common-law misdemeanour. The judicial test of obscenity is "whether the tendency of the matter is to deprave and corrupt those whose minds are open to such immoral influences and into whose hands a publication of this sort may fall."

Legal authorities of repute still lay down the principle, enunciated more than 50 years ago by Chief Justice COCKBURN, that a medical treatise with illustrations necessary for the information of those for whose education or information the work is intended may, in a certain sense, be obscene, and yet will not give rise to criminal proceedings, though, if such illustrations are "exhibited for anyone, boys and girls, to see as they pass," it may constitute an offence. The immunity, in fact, depends upon the circumstances of the publication. Certain observations during the recent libel action are a judicial recognition of a relaxation of the public standard of what tends to deprave. In 1877 CHARLES BRADLAUGH was convicted, along with Mrs. BESANT, of the criminal offence of publishing KNOWLTON's tract "The Fruits of Philosophy," an essay on the restriction of the population. The jury declared that the book was calculated to deprave public morals, and the Lord Chief Justice of the day condemned both defendants to be imprisoned for six months, to pay a fine of £200, and to enter into recognisances for five years to be of good behaviour—good behaviour including the withdrawal of the book. Now let us listen to something said by Lord Justice SCRUTTON the other day:—

> "In 1877 it would have been almost impossible to discuss publicly a subject of admitted importance, the causes, effects of, and remedies for venereal diseases, but since the war the most respectable newspapers have opened their columns to the plainest discussion of these matters and the most respectable persons have taken part in those discussions. The merits and methods of artificial birth prevention seem to me to stand in a similar position. In 1877 it would have been impossible to discuss them publicly; in 1923 there is probably a great change in public opinion as to the necessity of discussion coupled with great difference of opinion as to the desirability of such methods."

If CHARLES BRADLAUGH had published KNOWLTON's book to-day, would he have been prosecuted, much less convicted and sentenced to imprisonment? Doubtless the answer would depend on the circumstances of the publication. Propagandists do not always discriminate, and the old tag *maxima debetur pueris reverentia* is not yet obsolete. If we protect our schoolboys from the attentions of betting touts and money-lenders, we need not expose them to those of the booksellers who specialise in furtive pornology. Writings on birth control which are very far from belonging to that discreditable traffic have in recent years been treated by police-court magistrates as having a tendency to deprave. Such decisions are not easily harmonised with the greater latitude to which Lord Justice SCRUTTON gives testimony. As every magistrate is entitled to take his own standard in these matters, the position is none too clear. The policy of Parliament seems to be towards greater control. It will be remembered that in 1917, in suppressing quack treatment of venereal disease, the circulation of advertisements dealing with such treatment was prohibited. The proposed Judicial Proceedings (Regulations of Reports) Bill, designed to eliminate indecent details from the reports of divorce and other proceedings, is a significant movement in the direction of suppressing matters "tending to deprave."

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PHYSICAL TRAINING IN THE NAVY.

THE Navy has, as we know, done a great deal to help the British Medical Association meeting of this year, and in the afternoon of July 25th the members of the Association were invited to the Royal Naval School of Physical and Recreational Training to witness a demonstration of the education there given. In a fine gymnasium, on a floor whose boards recalled the corresponding provisions of the new law. As the new Bill appears to be pure consolidation and not to include any proposals for amendment, its passage through Parliament should be the easier. In introducing it into the House of Lords on July 26th the Earl of Onslow stated that, as soon as the Bill was passed, the consolidation of all statutory regulations on the subject would be undertaken. He also announced that a consolidation of the Housing Acts was intended. Meanwhile it is to be hoped that the Public Health Acts are not being forgotten. Their confusion is greater than that of the Health Insurance Acts, and they had a prior claim to be considered for consolidation.

THE TREATMENT OF VARICOSE VEINS: A NEW OPERATION.

VARICOSE veins, as is well known, occur in all classes, affecting both men and women, and in those following both sedentary and active occupations. Mr. Philip Turner[1] points out that while it is generally agreed that the essential factor is an increase of pressure in the veins, it must be admitted that in the greater number of cases presenting themselves for treatment no definite cause for the increase in pressure in the veins and no obvious cause for impeding the circulation can be shown. He offers an ingenious suggestion as to the cause of the obstruction to the return of blood in cases where it is not obvious, and describes a method of operative treatment which he has found successful. He believes that in a considerable proportion of cases of varicose veins, especially in those where the patient follows an occupation requiring prolonged standing, the real cause of the trouble is an obstruction to the flow of blood where the internal saphenous vein near its termination passes through the saphenous opening, leaving the subcutaneous tissues to join the more deeply placed and better supported femoral vein. He recalls the anatomy of the saphenous opening bounded on the outer side by the iliac portion of the fascia lata which has a sharp well-defined edge known as the falciform border. The upper wall of this (the superior cornu) turns inwards superficial to the femoral sheath to join Poupart's ligament. The lower portion, known as the inferior cornu, curves inwards, deep to the termination of the internal saphenous vein but superficial to the femoral sheath, to become continuous with the pubic portion of the fascia lata which covers the pectineus and adductor longus muscles, and is attached to the ilio-pectineal line of the pubis. Though there is no sharp alteration in direction, the internal saphenous vein here crosses the well-defined inferior cornu of the falciform edge and joins the femoral vein on a deeper plane, the sharp fascial margin intervening between the two vessels. This is a relationship where, according to Mr. Turner, some factor may easily produce a slight but definite degree of obstruction, which, acting continuously or intermittently over long periods, may produce far-reaching results. This additional factor is, he suggests, increase in the tension of the fascia lata. In the sitting or recumbent position the fascia lata is relaxed; in the erect position, on the other hand, the fascia lata is tense, and so also must be the sharp falciform edge with its superior and inferior cornua, the latter between the superficial and deep venous trunks. The obstruction need not be complete: a slight degree of interference acting over a long time will be quite sufficient to overfill the veins, to cause them to dilate, and eventually to become varicose. After a time the weakest valves will become incompetent, and then the effect of the increased pressure will be felt still more in the veins lower down in the leg. The localised swelling occasionally seen and known as a saphenous varix Mr. Turner attributes to a localisation of the trouble by a particularly competent set of valves which protects the distal portion. More generally the valves become incompetent, and the back-pressure, increased by the weight of the column of blood, affects first of all the vein and its tributaries below the knee. Another possible cause of obstruction at the termination of the saphenous vein are its tributaries—the superficial epigastric, the superficial circumflex iliac, and the external pudic vein—which are often surprisingly large, and the flow from them being from above downwards is in direct opposition to the flow of blood in the internal saphenous. This opposition to the return of blood in the internal saphenous, though probably trivial in the sitting or recumbent positions, may be of considerable importance in the erect position with a tense fascia lata and margin of the saphenous opening.

Mr. Turner suggests that in the operative treatment of varicose veins it is a wrong principle to excise or obliterate the main trunks of venous return, especially the chief of these, the internal saphenous. If the main trunk is removed a great strain must of necessity be thrown upon the smaller and less important vessels, with the result that they dilate and become varicose. The plan adopted by him is the excision of any large varicose veins. In those cases where it is considered that the varicosity is caused by obstruction at the saphenous opening he also divides the fascia lata from the saphenous opening downwards and transplants the long saphenous vein beneath the fascia, which is then sutured over it: at the same time the tributaries which join the internal saphenous at its termination are divided and ligatured. He does not suggest that this operation should be performed indiscriminately; on the contrary, a careful selection of cases must be made. But in a young or healthy middle-aged person, where other causes are absent, where the saphenous vein is thickened and dilated but not tortuous and varicose, where the varicosity affects the lower part of the internal saphenous and its tributaries, but where the small venous radicles are not involved, success may be expected. Mr. Turner has performed this operation, of which he gives full technical details, some 20 times during the past four years, and the results have been so encouraging that he intends to continue this method of treatment.

THE SOCIAL WELFARE OF THE INSANE.

IN a pamphlet printed in aid of the Society of the Crown of Our Lord[1] Dr. J. R. Lord has dealt with the problem of the social welfare of the patient in a mental hospital, believing that the time has come to revise the attitude of seclusion resulting from the cloudiness of mediæval thought which still darkens the public outlook in this connexion. Recalling the state of affairs before 1766, when "the doors of Bethlem were finally slammed in the faces of curiosity and wantonness," Dr. Lord states that "one has only to call to mind the disgraceful scenes which often characterise the admission of the public to the hearing of sensational divorce or murder cases to be reminded that there is a section of the public whose appetite for the morbid and unsavoury is insatiable, and there is not a doubt that the mental hospitals have had good grounds for their attitude to publicity." This attitude, however, has helped to maintain the continuity of public ignorance as to what insanity really is, although to say that the insane are treated "behind a shut door" is misleading. Dr. Lord points out that there must be at least 20,000 people employed in mental hospitals, that about 10,000 patients pass through the hospitals each year, and that anyone who gives the name of a patient can gain admission on visiting days; thus it would be difficult to keep anything secret save those personal details which are guarded as a matter of course. Nevertheless, the atmosphere of isolation persists, with detriment to the progress of psychological medicine, and Dr. Lord would have the life of the outside community brought obviously impossible to lay down any fixed regime in a variable climate. As an indication of the dose, the subjective sensations of the patient were largely taken into account and were found to be more important than the exact number of minutes that the treatment lasted. In this respect it is essential to obtain the coöperation of an experienced nursing staff. In 63 cases treated by Dr. Schürer no ill-effects were noted, in no cases did the temperature rise more than 0·2–0·3° C., there was no increase in the quantity of sputum, and no case showed signs of new foci or activity in an old one as a result of the treatment. Out of his cases 11 had previously had hæmoptysis, one 14 days before the commencement of the cure. In no single case did hæmoptysis occur during or after the treatment. The blood pressure was found to be usually slightly lowered during a sunbath, but was not constantly so. No increase was, however, observed, and this is additional evidence that heliotherapy bears no direct relation to hæmoptysis. The results of the treatment, when compared with those of the ordinary hospital treatment, were remarkably good, improvement taking place in severe cases which would have been given up under ordinary circumstances. In unfavourable weather artificial sunlight was given, so that patients who had become acclimatised to the sunlight should not lose their immunity and have to begin all over again.

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[1] Guy's Hospital Reports. London: Henry Frowde and Hodder and Stoughton. Vol. III. Fourth Series. No. 2.

[1] Social Workers and the Insane. An address delivered before the Society of the Crown of Our Lord in London on May 3rd, 1923. London: Adlard and Son and West Newman, Ltd. 6d.

Dr. H. Gödde,[6] of Honnef am Rhein, reports on the action of the quartz lamp in tuberculosis of the lungs. He radiates the chest and back three times a week, gradually increasing the duration. He has treated 655 cases during the last eight years, and points out that the treatment is not without danger, although if properly regulated it becomes a valuable adjunct to other forms of treatment. In 57 of his cases he observed an unmistakable reaction, with an increase in the physical signs in the chest. Cases of all degrees of severity were treated, but of those showing an unfavourable reaction, only 14 had tubercle bacilli in the sputum. In most of the cases it was wellnigh impossible to say if the bad effects were due to the quartz lamp, or would have come spontaneously or were due to some other factor; but in some of the cases there was a definite relation between the treatment and unfavourable symptoms, which could be produced at will in the form of an experiment. An illustrative case was that of a man aged 19, suffering from dry pleurisy, nodular fibrosis in the lungs, and tuberculous epididymitis. The temperature was normal, but on the evening of the third radiation rose to 38·5° C., and on the following evening to 39·5° C. He had a severe cough and a marked pleural rub. The temperature fell in 15 days. After 16 days free from temperature, the radiation was repeated. After two minutes the temperature rose to 37·3°, after four minutes to 37·5°, and after eight minutes to 40°. Well-marked signs of foci in both apices appeared, which, in spite of many weeks in bed, never quite disappeared during the whole course. The temperature returned to normal in 27 days. Hæmoptysis was noted in many cases after radiation, and Dr. Gödde is of the opinion that the treatment should not be used in advanced cases. Exact observations should be kept of the temperature and of the general condition, and although it is safe to treat patients ambulatorily so long as there is no reaction, on the first sign of any reaction they should be confined to bed. When they are under careful supervision he does not consider that a reaction is detrimental, but rather that it leads eventually to an improvement in both the local and general condition.

THE NOTIFICATION OF TUBERCULOSIS.

A LETTER has been sent personally during the week by the Ministry of Health to private practitioners throughout England and Wales reminding them of their statutory duty to notify cases of tuberculosis as soon as the diagnosis is made. This duty was enjoined by the Public Health (Tuberculosis) Regulations of 1912, but it is common knowledge that in some areas a large proportion, sometimes nearly one-half, of the persons dying from tuberculosis had not been previously notified as suffering from that disease. The practitioner is, of course, absolved from the duty if he has reasonable grounds for believing that the case has already been notified to the sanitary authority, but the Minister of Health puts upon him the onus of ascertaining this fact in case of doubt. Early notification of tuberculosis is rendered difficult by the fact that, in spite of all our progressive knowledge, early diagnosis is in many cases still difficult, and unfortunately there are persons who do not consult a doctor until the disease is in an advanced stage. Under the Regulations the notification is strictly confidential, and the fact of a patient suffering from tuberculosis becoming known to employers or neighbours through the medical officer of health can be disregarded. Notification is ordinarily followed by a visit from the tuberculosis officer; where in a particular case the practitioner considers this unnecessary it is now open to him to arrange that this visit shall be dispensed with. No doubt the circular letter will help in clearing up points which have so far stood in the way of whole-hearted observance of the Regulations.

APPENDICITIS CAUSED BY THE ASCARIS LUMBRICOIDES.

IN view of the rarity of parasitic infection of the appendix cavity in this country a case of ascaris appendicitis recorded in the June number of the *Irish Journal of Medical Science* by Dr. Kathleen Portley, is noteworthy. In February last a boy aged 4 was sent to St. Vincent's Hospital as a case of acute appendicitis. Ten days previously the patient had an acute attack of abdominal pain accompanied by vomiting and a rise in temperature which fell to normal in three days, the pain remaining. On admission the abdomen was very rigid, and there was general abdominal tenderness, most marked over McBurney's point. At operation, by Mr. H. S. Meade, the mesentery was found to be studded with tubercles with a slight amount of pus in the right iliac fossa, and wandering free in the peritoneal cavity was a worm about 6 inches long of the *Ascaris lumbricoides* type. There was no sign of perforation of the intestine, but the ascaris was found to have emerged from the alimentary canal by perforating the tip of the appendix, which was slightly inflamed. Appendicectomy was followed by a speedy recovery, anthelminthics being administered during convalescence. Dr. Portley, in examining the literature, has found no record of a similar case, though the presence of ascaris in gall-bladder and ducts has often given rise to serious complications.

A NEW HEALTH INSURANCE CODE.

EARLIER in the year, when urging that the Public Health Acts should be reduced into one complete and up-to-date document, we mentioned the probability that this process would first be applied to the law of National Health Insurance.[1] The anticipation has been justified. A bulky House of Lords Bill has just appeared. It can make no immediate progress, but, when Parliament reassembles, once the Bill has passed the scrutiny of the Joint Committee on Consolidation Bills, it should speedily become law. The Bill consists at present of 133 clauses and six schedules. On a casual examination it seems to be well planned and sensibly arranged, so that laymen as well as lawyers will be able to find their way about it. All the old law is to be repealed, with the usual saving clause that outstanding rules and regulations (and it is often the regulations rather than the Act itself which most concern the medical practitioner) made under any repealed Act shall continue in force as if made under was greatly reduced; the highly concentrated urine irritated the bladder, adding severe pain on micturition to the patient's other urinary troubles. The pollakiuria was not one whit the better for this treatment, which was promptly abandoned. The treatment which was then adopted, and which proved highly successful in both cases, consisted of repeated distension of the anæsthetised bladder by increasing quantities of fluid. First an intravesical injection of cocaine was given, and then 150 g. of fluid were introduced. This treatment was repeated at first every other day, and later every day, the amount of the injected fluid being ultimately raised to 500 g., and the patient being trained to retain this fluid for increasing periods. This re-education of the bladder was completed in 15 days, and the patient was able to leave hospital after a month, by which time he no longer had to get up at night, and required to pass water only four or five times during the day. The record of the second case was also one of rapid and complete recovery. In neither of these cases was there any nocturnal enuresis, and on the rare occasions when enuresis occurred by day it was more or less a voluntary act, prompted by the semi-conscious decision to let the urine escape into the clothing rather than, by waiting for a suitable opportunity to micturate, to excite an attack of pain and spasmodic retention. Whatever the incidence of psychic pollakiuria may be, it is obvious that before this condition is diagnosed, and the treatment described is instituted, all the other possible causes of pollakiuria must be eliminated by a thorough examination.

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[6] Deutsch. med. Wochens., June 15th, 1923.

[1] THE LANCET, 1923, i., 857.

EXTRAPLEURAL THORACOPLASTY IN PULMONARY TUBERCULOSIS.

A SHORT monograph has recently been published by Prof. H. C. Jacobaeus and Dr. Einar Key[1] on the treatment of pulmonary tuberculosis by extrapleural thoracoplasty. The authors deal with 60 cases, in 15 of which fitness for work, and in 19 definite improvement, were achieved. In 44 of their cases there had been an observation period of at least a year and a half since the operation, and among these 44 patients there were 12 who were restored to fitness for work and freedom from symptoms, and 8 who were definitely improved. It may therefore be calculated that this operation may restore approximately 27 per cent. to comparatively good health, and may effect considerable improvement in 18 per cent. By themselves these figures may not seem very cheerful, but the results achieved well deserve the description "remarkable" when it is remembered that the patients submitted to this treatment had been completely invalided by their disease for several years. Some interesting and rather curious facts emerge from a study of these cases. The average duration of the disease in the cases which benefited from the treatment was 5·15 years, whereas it was only 4·27 years for the unsuccessful cases. This suggests that the acute case does not respond well to this treatment. In 38 cases the left side of the chest was operated on, and among the 22 right-sided cases there were only 6 which responded satisfactorily to the operation. Among the left-sided cases there were, however, as many as 18 successes. Why this should be so is not clear, but the authors note that the late Prof. Saugman and Prof. Sauerbruch's assistant, Dr. Brunner, have also found that thoracoplasty is more often successful on the left than on the right side. Again, there were only 24 male to 36 female patients, and this disparity appears in the statistics of other operators. The reason for this is still a matter for conjecture. One of the most important matters concerned with the selection of cases for this treatment is the standard by which the efficiency of the healthier lung is to be judged. Some surgeons insist on an immaculate record from the healthier lung, or they may make a concession only to such hilum disease as radiologists alone and a few talented percussionists can demonstrate. The authors were less nice in this matter; only in 14 of their cases did the healthier lung appear to be perfectly normal or the seat of only slight hilum changes. In the remaining 46 cases the X rays or the physical examination or both betrayed involvement of the parenchyma of the healthier lung, which in 28 cases was shown to be diseased by both methods of examination. Their experience has taught the authors that it is not so much the extent and localisation of the disease in the healthier lung that matters as its character. If the disease is arrested in this lung, even half the lung may be involved and yet thoracoplasty on the opposite side may be justified.

A SURVEY OF DISEASES OF THE LUNGS AND PLEURÆ.

THE writers of text-books, and even of text-books which have much merit, may go wrong in two ways: they may set up their own views to the exclusion of all others but without bringing forward the necessary justification, or they may act as impersonal compilers but discharge their task without due judgment. Many writers of the latter class abstract without discrimination, allotting each author the same space with an impartiality which does their powers of criticism no credit. In a recent comprehensive survey[1] of the subject of diseases of the lung and pleuræ the authors have chosen the happy mean between these two extremes, and they have fused their great experiences with those of the most reliable of their fellow-workers. This survey is published as No. 12 of the series of 22 volumes of the System of Medicine, edited by G. H. Roger, Fernand Widal, P. J. Teissier, and M. Garnier. With regard to the relative importance of heredity and infection, they have no doubts; hereditary immunity has never, in their opinion, been proven, and they regard as negligible the part played by heredity in the outbreak of tuberculosis. Their survey of the problem of tuberculosis complicated by pregnancy shows how different is the attitude of the French from that of the German medical profession. In France, the induction of abortion in tuberculous women is regarded with little favour, and it is considered warrantable only in very exceptional cases. The short chapter on the relation of tuberculosis to influenza shows how divergent are the opinions of various writers; whether a physician considers influenza a perfectly harmless or a most sinister complication of pulmonary tuberculosis, he will find himself in excellent company. The authors' discussion of specific treatment reveals the same diversity of opinions, and their own lack of faith in it is betrayed by their comment that the advocates of specific treatments commonly reserve them carefully for slight cases and those which show a definite tendency to spontaneous recovery. The principle, according to this view, is that of rushing to the aid of the victor. The chapters dealing with diseases of the pleuræ are short but full of valuable information, and it is interesting to note that the opinion, formed by Landouzy as early as 1881, that pleurisy *a frigore* is merely a misleading synonym for tuberculous pleurisy has subsequently been justified. Primary rheumatic pleurisy, unassociated with any articular manifestation of "rheumatism," is also regarded by the authors as a figment of the imagination, and nothing but a euphemism cloaking tuberculosis.

WE regret to announce the death on July 28th, following an operation, of Dr. Flora Murray, who was for long officer-in-charge of the Endell-street Military Hospital.

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[1] Weitere Erfahrungen über Thorakoplastik bei Lungentuberkulose. Supplement III. to Acta Chirurgica Scandinavica, 1923. Pp. 88.

[1] Nouveau traité de médecine, pathologie de l'appareil respiratoire. By Dr. M. Letulle, Dr. P. Halbron, Dr. P. Harvier, Dr. M. Pinard, and Dr. L. Ribadeau-Dumas. Paris: Masson et Cie. 1923. Pp. 596. Fr.40.

to bear upon the life of the mental hospitals by means of hospital visitors and social workers.

> "Truly a mental hospital is a house of comedy and tragedy. Reasoning and argument have no practical value therein. Only sympathy, kindness, and true friendliness are of any avail. . . . How are the insane kept in a mental hospital? If they decided to go home, home they would go. Our light hospital buildings and the proportionately few nurses would not keep them a moment; yet escapes from asylums are perhaps fewer than from prisons. . . . Bars to windows, physical restraint, &c., are practically unknown nowadays in mental hospitals. The chains are there, however, although not forged from iron or steel. They are much stronger and more effective, being links of kindness and persuasion, the artificer being the doctor and the nurse. So it is not that the ground is barren for the exercise of these virtues."

Every mental hospital ward or group of wards, then, should have its social visitors—level-headed, discreet, and kindly men and women with some idea of mental disorders, who would pay particular attention to friendless patients, and would act as a connecting link between those patients who had homes and their relatives. The onset of mental disorder which leads to a patient's removal from home is often sudden, and the effects upon family affairs catastrophic; here there is obviously a useful avenue of work for the social visitor. Moreover, the visitor would gather valuable information concerning the patient's home environment, which would help the medical officer in his treatment and disposal of the patient. Dr. Lord speaks of the great difficulty of arriving at the truth in cases of mental disorder, the relatives being frequently unwilling to disclose information; here the social visitor's evidence would materially assist the case. Dr. Lord quotes the successful experiment begun at Horton Mental Hospital, Epsom, in June, 1922, when Miss E. M. Dale was appointed as hospital visitor. Although this lady has limited her activities largely to recently admitted patients and to acute cases, she has also followed up cases sent to the main building, and lately has also been investigating the condition of patients prior to admission. The results have been so successful that the hospital management are keenly desirous of extending such work to the whole building, and for this purpose more helpers are required. This is a beginning. The strength of the movement will be founded on the fact that such visitors will not be officials, and will, therefore, be free from the suspicion with which all official asylum workers are regarded. Dr. Lord closes his remarks with a reference to the already extensive social work of this nature carried on in connexion with State mental hospitals in America, and with the expression of a certainty that before long no mental hospital administration will be considered complete without its hospital visitors and associated workers.

ACETYLENE AND ETHYLENE AS ANÆSTHETICS.

RECENT contributions, both on the continent and in Canada and America, have amplified our knowledge of the anæsthetic action of ethylene and of acetylene. The number of cases so far reported is not great but suffices to show that both these gases are capable of producing complete muscular relaxation in some subjects and can be safely extended over periods of time long enough for most major operations. Both gases are, of course, highly inflammable, and ethylene provides with air an explosive mixture if it reaches the proportion of 4 per cent. Acetylene and ethylene are used from cylinders like those employed for nitrous oxide, and are given together with oxygen. Acetylene is administered in the proportion of 60 per cent. to start with. This is generally increased to 70 for producing full anæsthesia and can afterwards be lowered even to 20 or 30 per cent. in the course of a long operation. The inhalation is said to produce no disturbance of pulse, respiration, or blood pressure. Recovery is described as being remarkably rapid and the proportion of subjects suffering from post-anæsthetic nausea or vomiting small. In the case of ethylene there were 14 instances of vomiting after 92 inhalations. Gauss and Wieland have used acetylene in 220 cases. They precede the inhalation by one or more injections of morphia and scopolamine. The anæsthesia produced by both ethylene and acetylene appears to be comparable with that obtained from nitrous oxide. Wieland believes that this is essentially different physiologically from the anæsthesia of ether and chloroform and the other lipoid-solvent anæsthetics. His argument, however, comprises the disproved supposition that nitrous oxide and oxygen cannot produce anæsthesia unless administered under pressure. This was, of course, Paul Bert's belief, but it has been fully shown to be erroneous.

DANGEROUS DRUGS.

IN pursuance of Section 7 of the Dangerous Drugs Act, 1920 (10 & 11 Geo. 5, cap. 46) a regulation—the Dangerous Drugs (No. 3) Regulation—amending the Dangerous Drugs Regulations, 1921, has been made. Regulation 15 of the Dangerous Drugs Regulations, 1921,[1] will take effect after August 1st, as if at the end of the regulation were inserted the following words:—

> "If a foreign ship in any port in Great Britain requires to obtain a supply of any of the drugs in order to complete the necessary equipment of the ship, the master of the ship is authorised to purchase and be in possession of such quantity of any of the drugs as may be certified by the medical officer of health of the port where the ship is (or in his absence by the assistant medical officer of health of the port) to be necessary for the purpose, the quantity not to exceed what is required for the use of the ship until it next reaches its home port. The certificate given by the medical officer or assistant medical officer of health of the port shall be marked by the supplier with the date of the supply and shall be retained by him and kept available for inspection."

THE TREATMENT OF NERVOUS POLLAKIURIA.

A COMPARATIVELY rare manifestation of a psychopathic constitution is frequency of micturition for which no organic cause can be found. A report by Dr. Chavigny in *Paris Médical* for June 30th deals with two such cases, which show how easy it is to go astray in the treatment of this condition, and how, by appropriate treatment, a complete cure can be effected. The first patient was a man, aged 21, whose father had suffered from incontinence of urine, and whose mother and sister were extremely neurotic. The patient had never been seriously ill, and there was no record of nocturnal enuresis beyond the normal limits of infancy. For several years frequency of micturition had become progressively worse, and he had to get up at night five or six times to pass water. There was also pollakiuria by day, and when he could not at once respond to the desire to micturate he experienced severe pain in the lower abdomen, and there was spasmodic retention of urine for some little time. Examination in hospital failed to show any local pathological condition to account for his symptoms, and the history he gave of the treatment he had hitherto received was as instructive as it was full of mistakes. His first medical adviser, consulted in 1921, had diagnosed gravel, and had prescribed the treatment supposed to match this disease. The results were entirely negative. The next practitioner made a rectal examination and diagnosed prostatitis. This, of course, required massage of the prostate, but again no benefit was obtained. The third practitioner consulted decided that the urinary tract was intact, and that the condition requiring treatment was a muco-membranous enteritis. A fourth practitioner found a little cystitis, but was not inclined to prescribe intensive local treatment, regarding the pollakiuria as a concomitant of disordered intestinal functions. Dr. Chavigny, being unable to find any organic disease such as tuberculous cystitis, decided, more or less by a process of exclusion, that the irritability of the bladder was of psychic origin. His first therapeutic essay was a complete failure. For 24 hours the supply of fluids affected area, and if there be no sepsis the result of this treatment is often excellent, but it will generally be found that the tar ointment to be described is preferable. Its composition is as follows: purified coal tar and zinc oxide, of each two parts, corn starch and vaseline, of each 16 parts. This should be used liberally, all old ointment being removed before a new application is made. There are cases where the condition persists in spite of these remedies, and then further investigations must be undertaken. The method of feeding should be inquired into and any error of diet rectified. The defect may often only be determined by an examination of the fæces by an expert.

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[1] S.R. and O., 1921, No. 865.

Protein Sensitisation.—American dermatologists have called attention to the possibility of protein sensitisation in infantile eczema, and have elaborated a system of cutaneous tests to demonstrate this condition where it exists. As is well known, many individuals subject to asthma have suffered from eczema in infancy or childhood, and since, in certain cases at least, asthma is a form of anaphylaxis, it was thought that both conditions could be attributed to a common factor. The skin is scarified, the test protein rubbed in, and the degree of sensitisation determined by the resulting reaction, a wheal with marked erythema or œdema, which may appear within a few minutes, reaching its height in about 15 minutes, being regarded as positive. This method has attracted considerable attention and has, since its introduction, been investigated by many workers. It appears to have a definite value in asthma, but in eczema it has not fulfilled the earlier expectations, and may still be regarded as under trial.

Conclusion.

It will be seen from what has been said above that the treatment of infantile eczema lies mainly in the use of external applications; they may be used in the following sequence: first, simple remedies such as boric-zinc ointment, and secondly, the tar ointment, the formula of which has already been given. If the desired result is not achieved by these remedies, then a complete investigation into the diet of the infant should be undertaken, including an analysis of the stools.

In all cases aggravation by trauma should be guarded against and the use of soap and water to the affected parts avoided. The favourable progress of any case will largely depend upon attention to details. The intractable nature of many forms of the disease is acknowledged, but this should not lead to half-hearted methods. Where the disease is vigorously attacked it will often be found to respond to the methods employed.

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Previous articles in this series are:—

I. Medical Treatment of Gall-Bladder Disease, by Sir Humphry Rolleston. II. Early Pulmonary Tuberculosis in the Young Adult, by Dr. Claude Lillingston. III. Neuralgias of the Head and Neck, by Dr. Wilfred Harris. IV. Whooping-Cough, by Dr. T. Izod Bennett. V. Scabies and Pediculosis, by Dr. H. W. Barber. VI. Abdominal Injuries, by Prof. Charles A. Morton. VII. Aural Discharge in Children, by Mr. Harold Barwell. VIII. Vaginal Discharge, by Mr. A. W. Bourne. IX. Minor Injuries to the Eye, by Sir J. H. Parsons. X. Epilepsy, by Dr. Gordon Holmes. XI. Inguinal Hernia in Childhood, by Mr. C. W. G. Bryan. XII. Oblique Inguinal Hernia in Adults, by Prof. A. W. Sheen. XIII. Eclampsia, by Dr. Gibbon FitzGibbon. XIV. Club-foot in the Newly-born, by Sir Robert Jones. XV. Intestinal Worms, by Dr. R. Hutchison. XVI. Primary or Spasmodic Dysmenorrhœa, by Dr. G. Blacker. XVII. Measles, by Dr. Foord Caiger. XVIII. and XIX. Heart Failure, Preventive Treatment; Therapeutics, by Dr. J. Parkinson. XX. Gonococcal Epididymitis and its Bearing on Sterility, by Mr. Kenneth M. Walker. XXI. Ante-partum Hæmorrhage, by Dr. T. Watts Eden. XXII. Ringworm, by Dr. A. Whitfield. XXIII. Cystitis, by Mr. J. B. Macalpine. XXIV. Hæmorrhoids, by Mr. R. M. Rowe. XXV. Puerperal Sepsis, by Lady Barrett. XXVI. Cyclic Vomiting, by Dr. G. F. Still. XXVII. Asthma, by Dr. E. P. Poulton. XXVIII. Traumatic Rupture of the Urethra, by Mr. G. Grey Turner. XXIX. Treatment of Habitual Constipation, by Dr. Arthur F. Hurst. XXX. Treatment of the Hypertrophied Prostate, by Prof. Charles A. Pannett.

Special Articles.

PROBLEMS OF ACCLIMATISATION.*

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GENERATIVE FUNCTIONS AND GROWTH.

IN a consideration of this kind the effect of a tropical climate on the generative functions is naturally of great importance. In both male and female there is greater generative vigour in the tropics, but excess in venery is more speedily followed by exhaustion and neurasthenia than is the case in temperate climates. Puberty is attained at an earlier age in the tropics, and in European girls living under tropical conditions menstruation begins about a year earlier than would be the case in a temperate climate. Race, however, is said to play a more important part than climate in the acceleration. Hot climates may upset the menstrual cycle in white women. According to Mackinnon,[38] they sometimes shorten it and increase the menstrual flow. The same author thinks there is some evidence to show that intermenstrual periods are more uncommon in the tropics. In the case of white women arriving in the tropics menstruation may cease for a space to become re-established later. There is little evidence available regarding the effect on the menopause, but it does not appear to be altered.

Leonard Hill states that tropical atmospheric conditions lessen the fertility of European women, and Sir Harry Johnston,[39] speaking of Jamaica, draws attention to the tendency of white women in the tropics to bear fewer children. This is the case, but it is difficult to determine how far climate alone is to blame, as several factors are doubtless concerned. There can, however, be no doubt that life in the tropics does throw a very considerable strain on the generative system of women, though how far this is likely to affect the race springing from them we have at present no means of actually determining.

It is interesting to note that Lenz,[40] writing in 1921 on the phylogenic neurasthenia in East African natives, expresses his belief that the act of will depends upon a hormone supplied by the germ glands and that a tropical climate checks its development. This, of course, is only a hypothesis, but it is significant that more and more observers are directing their attention to the endocrine glands in their endeavours to explain some of these climatic effects.

Turning now to the question of growth, the stimulating effect of tropical conditions upon the machine is only too evident. Growth is as a rule rapid, but is unaccompanied by increase in weight and strength. Hence the "weedy" European child so common in the hot moist tropics. It is more than likely that the heat acts by stimulating the sympathetic nervous system which controls the functions concerned with growth and nutrition.

THE NERVOUS SYSTEM.

Such a consideration leads us finally to the changes induced in the nervous system itself. As has already been said, it is on this system that the chief stress of a tropical climate falls, and this is the system which presents the greatest barrier to white colonisation. Do what you will in the way of abolishing disease and in improving living conditions, you cannot altogether shield the delicate nervous system from the effects of heat. Out of doors, of course, the brain and spinal

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* The second of a series of lectures, delivered at St. Bartholomew's Hospital on June 14th under the auspices of the Academic Council of the University of London. The first lecture appeared in THE LANCET of June 30th, and the preceding portion of the second in THE LANCET of July 14th.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXI.

THE TREATMENT OF INFANTILE ECZEMA.

THERE is no condition where the ingenuity of the physician is more taxed than in the treatment of infantile eczema. This is chiefly because we are dealing with a symptom, not a disease, and therefore the methods employed must change from time to time if they are to meet the requirements of the condition as they arise. For this reason the treatment of eczema, either in infants or adults, is to some extent unsatisfactory, but even if it be accepted that we are only treating a symptom, a great deal can be done by proper methods to shorten the course of disease and to bring it to a satisfactory termination.

Since diagnosis must always precede treatment, it is of importance first to take under consideration three conditions; two are properly included under the heading of eczema and the third, a pyogenic infection, is often mistaken for it. This third condition is a variety of impetigo and is found in infants distributed over the buttocks and napkin area as a red moist exuding surface, at the margins of which phlyctenules may be detected, evidence of the streptococcal nature of the infection. In this type of eruption, since we know the cause, the indications for treatment are clear. Strict cleanliness should be observed, the affected parts being kept as dry as possible and the eruption treated with mild antiseptics such as boric lotion, dusting powders containing boric acid, or simple boric ointment. In exceptional cases antiseptics of a more powerful character may be required, but if the nature of the condition is correctly interpreted, the appropriate remedies will suggest themselves and do not require further consideration here.

Seborrhœic Eczema.

The varieties of eczema met with in infants are two—seborrhœic eczema and true infantile eczema. Seborrhœic eczema, in contrast to the other form, is relatively rare, and it differs further in the manner in which it yields to appropriate treatment. The eruption affects certain areas by preference, the scalp and the flexures of the arms and knees; it is also met with behind the ears. The individual lesions tend to be sharply demarcated, the distinction between healthy and diseased skin being clearly seen. On the scalp circinate erythematous areas occur and these are usually covered with greasy yellow scales. Perhaps the most definite evidence of the nature of the eruption is found in its response to treatment, for it will usually rapidly disappear upon the application of weak sulphur or mercury ointments. When the eruption is present behind the ears it may be mistaken for an impetigo, but since both conditions can be treated in a similar manner, difficulty will not arise in deciding what remedy to use in these cases.

Infantile Eczema.

The more common and more characteristic infantile eczema differs in many ways from the above-described dermatoses. In the treatment of this disease many remedies may be employed, and this in itself is evidence of the difficulty of obtaining cure. Like eczema in general, the eruption is wanting in demarcation, the edges being ill-defined and tending to merge into the surrounding healthy skin. The disease occurs during the first two years of life and is characterised by erythematous areas with vesiculation. These vesicles discharge fluid—the eruption weeps—and this fluid coagulates and forms crusts. The regions principally affected are the scalp, cheeks, and forehead, an area around the eyes and mouth being usually spared. The arms, legs, and trunk may also be involved in extensive cases. There is intense itching and this character complicates treatment because the infant, in the attempt to relieve the abnormal sensation, rubs, and thereby aggravates and prolongs the duration of the disease.

As has been pointed out above, the indications for treatment vary from time to time as the disease progresses or alters. While the actual details of treatment are thus difficult to define, the general principles are more exact and may be summarised as follows under three headings: First, the correction of any coccal invasion; secondly, the protection of the parts involved; and thirdly, the employment of remedies which have a specific effect on the disease.

The Correction of Coccal Invasion.—As in many of these cases, owing to the nature of the eruption, the skin is so altered as to become a suitable medium for coccal growth, secondary invasion with pyococci is a common occurrence. It is not possible, however, to treat the condition thus arising with antiseptics as ordinarily understood, for the result would be seriously to aggravate the eczematous process. The particular circumstances may, however, be suitably dealt with by means of the boric-starch poultice, a remedy of great value, especially where much crusting is present. The accumulation of crusts, indeed, of itself demands the use of this remedy, for it is obvious that unless all crusts are removed the ointments, or other remedies employed, cannot come into the necessary intimate contact with the diseased surfaces. The boric-starch poultice thus acts in two ways: first, in removing surface accumulations, and secondly, as a detergent, and although it is not indicated in every case, the improvement following its use under proper circumstances is considerable. To achieve its objects it should be used cold and about one inch thick; apart from these details the exact method of its application is a matter of lesser importance.

The protection of the parts affected with eczema demands consideration. Reference has already been made to the pruriginous character of the disease and to the effects of unchecked scratching. To prevent scratching some form of mechanical restraint is necessary, as, for example, pinning the sleeves to the bed or imprisoning the arms in light splints made of corrugated paper. In putting these methods into operation care should be taken to see that the comfort of the infant is not too much interfered with. Rubbing the head on the pillow is more difficult to check, but the effects of this can largely be neutralised by enveloping the head in a suitable linen cap, adjusted in such a manner that it will not easily slip. It is important to pay attention to these details, for one prolonged bout of scratching or rubbing may undo the results of days of treatment.

The application of specific remedies is perhaps the most important of all measures. In the choice of the remedy indications may be obtained from observation of the state of the eruption. Where there is much erythema lotions such as calamine lotion without glycerine may be employed. It acts largely by its mechanical effect; when applied to a skin surface the water evaporates and thus the area under treatment is cooled and the erythema and itching lessened; the powder remaining after the fluid has evaporated further cools the surface and also affords protection to it. Calamine lotion should be used neither too long nor over too extensive an area. If used too long it will cause chapping and cracking of the parts treated; if used over too extensive a surface catarrh of the alimentary or respiratory tract may be induced, with possible serious results. Ointments are more generally indicated and their use may be said to constitute the principal method of treatment. Generally speaking, only simple applications should be employed, and for ordinary purposes a mixture of boric and zinc ointments in equal parts will be found suitable. There are many cases where nothing more than this will be required. Where, however, the eruption proves rebellious, some application of a more active character is demanded, such as coal tar. Some dermatologists recommend the application of pure coal tar to the of John Bull. Mice modified as above mentioned were found to have acquired a greater resistance towards heat.

Observations on the effect of the artificial tropical climate on the growth and pigmentation of hair and the dependence of these integumental functions on the temperature coefficient are recorded, but we need merely note the fact that the hair of recessive albino mice, when exposed to humid heat or to the radiation of strong light, acquired the power of producing pigment, and the suggestion that the optimum temperature for pigment production appears to fall within the range of tropical heat.

The author found no evidence that retardation of growth is due to an excessive amount of the thyroid hormone in the blood, but suggests that a tropical climate may, at least for mice, lessen the demand for thyroid hormone in the body. Here again we have the endocrine gland question cropping up, and it is clear that the whole problem of internal secretions as they may affect life in the tropics is worthy of attention.

Finally the effect of humid heat on the blood morphology of mice was studied and it was found that—

1. Progressive changes in the direction of an increase of the number of erythrocytes occurred in those mice which for the greatest part of their life or since birth had been confined in humid heat. It is suggested that this change is primarily due to inspissation of blood.
2. Progressive diminutions of the white count occurred in a number of generations of mice which were reared in humid heat. It is suggested that this change was produced by high sensitivity to an increase of temperature exhibited by organs concerned in new formation of white blood cells.

In view of Grober's [24] work on men in the desert one is inclined to ask if the red cell increase may not have been due to the stimulating effects of light. It would have been better, had it only been feasible, to employ sunlight instead of electric light, but it will, I think, be admitted that the results obtained are at least suggestive. They do not, however, aid us as regards the effects of climate on the nervous system, which appears to me to be the crux of the whole question. In this country the chief physiological work having a bearing on the subject under discussion is that carried out by Leonard Hill[41] and his collaborators on human subjects. It has, of course, had to be limited to the effects of humidity, heat, and light on the individual rather than the race, and has been largely concerned with questions of safeguarding health and securing comfort. There is much of interest to the tropical hygienist in Part II. of Prof. Hill's "Science of Ventilation and Open-Air Treatment," wherein reference is made to the work of Shaklie in acclimatising monkeys to the sun in the Philippines, such acclimatisation depending on an increased sensitivity in and efficiency of the sweating mechanism. One would fain linger over some of the physiological results, for they are at present the only beacon-lights which may guide us to the haven of certainty, but time is limited and before summing-up the evidence available and saying something about preventive measures and the future outlook it is advisable to consider briefly the pathological effects exerted by a tropical climate per se on the white sojourner.

PATHOLOGICAL EFFECTS.

So far as these are represented by nervous ailments it must be admitted that the boundary line between physiological and pathological effects is ill-defined. We do not know if demonstrable changes are induced in the nerve tissues. Little opportunity is afforded for observation upon this point in man, and only a skilled neurologist could decide the question. Insomnia, however, may be regarded as a pathological symptom. It is due to heat and excessive atmospheric humidity. Congestive disorders, affecting especially the liver and bowels and usually of a transitory nature, are probably caused by sudden changes of temperature. Concentration of urine may give rise to some renal irritation, especially in the newcomer, but there is no evidence that tropical climates damage the kidneys in any way. On the contrary, they are usually beneficial, lessening the strain on renal tissue. Tropical light may produce pathological effects on the skin, such as are seen in xeroderma pigmentosum and in cases of severe erythema, blistering, and œdema, but none of these conditions are of much significance, nor is the conjunctivitis which Finny [47] attributes to the light or actinic rays. Indeed, apart from heat exhaustion, heat-stroke, and the sudden coup de soleil, which will not here be considered, we must admit that the actual pathological effects of a hot climate are few and far between.

GENERAL CONSIDERATIONS.

It has been impossible for me in two lectures to go very deeply into a subject on which quite a formidable literature now exists, but I have endeavoured to give you some idea of the work which has been accomplished, the views at present held, and, it is to be feared, the complexity of the problem. I confess that one is tempted to echo the plaint of de Langen and Schut,[26] who stated that a study of the literature had revealed to them "a number of hypotheses in chaotic disorder, without proofs and without a leading idea being manifest in the various considerations." And yet I am inclined to consider them a trifle pessimistic, perhaps because their own and subsequent investigations have cleared the air a little. There can, I think, be no doubt that with due care, and provided the hygienist comes to the rescue in the way of providing a healthy environment, the individual white settler, man, woman, or child, can at the present time exist perfectly well under tropical conditions, and enjoy a fair measure of health for considerable periods at a stretch. It would seem, moreover, that a certain proportion of white men and a few white women can carry on active outdoor life in tropical heat year in and year out without much detriment to their physical and mental vigour.

Even in unhealthy surroundings it is remarkable what can be accomplished nowadays in the case of white children, as Bercovitz [48] demonstrated at Hainan in South China. This island is very hot, and there is a liability to abdominal chills owing to the sudden breezes which spring up. Moreover, the place is very unhealthy, malaria, hookworm, and dysentery being rife. Fresh cow's milk is not obtainable. It is said that a white child cannot play outside between 8 in the morning and 5 in the afternoon owing to the intense heat. Yet by the provision of roomy, well-ventilated houses, proper screening, and ceaseless skilled medical vigilance, with coöperation of the mothers, it has been possible during the last seven years to rear 16 children born to American missionaries. These children are described as healthy. Still, be it noted, there is one proviso—a yearly change to a cooler climate for both mother and children in order to restore vigour. There one has it—an exhausted nervous system, despite all the protection afforded. Again, is it not significant that the Annual Report of the Dutch Indies Medical Civil Service for 1920, published in 1922, states that out of 189 cases of disease on account of which leave was granted, no less than 111 were examples of psychoses or psycho-neuroses?

Hence, though I would like to keep an open mind, and though at one time I was inclined to think that the balance of evidence was on the side of Gorgas [49] and his school, I am not so sure, after a course of Huntington,[9] and, as a result of personal experience, that my mental pendulum is not swinging in the direction of Sir Havelock Charles and those who agree with him, and this even as regards the question of continuous prolonged residence in hot climates for the individual, at least in the low-lying tropics and under existing conditions.

So far as the race is concerned, I am persuaded that the hot and humid tropics are not suited to white colonisation and never will be, with our present knowledge, even if they are rendered as free from disease as England. As to the dry tropics and elevated cord can be protected, and it should be noted that Leonard Hill and Argyll Campbell,[41] in a recent paper on heating of the tissues of the body by light and heat rays, have confirmed the utility of helmets and spinal pads by showing that local heating may occur. Again, the eye can be suitably guarded against heat and glare. Indeed, I have known some men so convinced that the eyes were the vulnerable spots, that they thought nothing of going about bareheaded in the hottest weather so long as they were wearing tinted glasses. What is more, they did so with impunity, but they had good heads of dark hair. There is, however, the whole network of peripheral nerves to be considered, and presumably in the case of white field-workers the heat must affect these in some degree. At first tropical heat stimulates, but the stimulation is followed by depression, and if this depression be exaggerated we get the neurasthenic condition so often associated with loss of memory. Here and there mention has been made of the kind of thing that happens. Cook,[42] writing of Uganda, has detailed the symptoms he has noticed in the case of old tropical residents and missionaries: such as tachycardia with a pulse unduly sensitive to posture, increased knee-jerks, sleeplessness, and reaction to small stimuli, as, for example, starting at a sudden noise. All this is evidence of nervous irritability, like the "Punjab head," "Bengal head," and "Burmese head" of the East. I have noticed that what may be called a delayed or interrupted form of cerebration is far from uncommon in the hot weather, while a more serious sign are those outbursts of passion induced by some trivial cause and which Plehn regards as being due to a weakening of control of the higher centres over the lower. There can be no doubt that with marvellous celerity the mole-hill becomes the mountain. Very hot, dry countries are those which try the nervous system, more especially if they are plagued with high winds, and women and children in particular suffer. Indeed, as regards European children in the tropics generally, it would seem that their nervous systems are in a state of unstable equilibrium, so that, quite apart from illness, fretfulness and peevishness are common and a condition approaching hysteria may even be encountered. One is inclined to regard such manifestations as of serious import for the welfare of the race, and the mothers suffer with the children.

General Metabolism.

So much for the different systems. Let us glance for a moment at the question of what we may call general metabolism. As far as differences in temperature are concerned, climate has never been regarded as altering to any extent the metabolism of man, but in 1920 de Almeida,[43] a Brazilian physiologist, declared as a result of direct observations that the inhabitants of warm climates, both white and black, have a much lower basal metabolism than that of persons living in cold or temperate regions. For whites he placed it at 30–35 calories per square metre of body surface per hour and for negroes at 32·86, whereas the average in temperate climates is 39 with a maximum variation of ± 10 per cent. in normal persons.

This lowering of metabolism was thought to represent an adaptation to local conditions, and to constitute an advantage in the struggle against high temperatures, there being a diminution of the usual heat production which attends chemical cell activity. If de Almeida is right his findings are significant, but it would seem he is in error, for the Dutch hygienist Eijkman[44] has repeated in Java work he previously carried out, and has confirmed his former figures, which were in the neighbourhood of 40 calories per hour both for white and coloured persons. In favour of the Brazilian's view, however, Cohen,[45] of Philadelphia, has cited the pioneer work of Mayer on the blood, to which reference has already been made, and which indicated a lessened oxidation of tissues in tropical countries. Here again, then, we see discordant results and contradictory views, though it would seem that basal metabolism is not lessened and that the body temperature is regulated by the greater eliminative activity displayed.

With so many knotty questions to be solved it is perhaps surprising that, until recently, physiologists in temperate countries had done so little in the way of research into the climatological physiology of hot countries, employing experimental animals. Such inquiries, it is true, can only supply an indication of what may occur in the case of white settlers in the tropics, but they are likely to be useful and give a lead for the carrying out of anthropological investigations on the spot. It was a conception of this kind which induced Sundstroem[46] to apply himself to his studies on the adaptation of albino mice to an artificially produced tropical climate. It is unnecessary to describe his experiments in detail, but it may be said that the diet was carefully controlled. The record can be found in the *American Journal of Physiology* for 1922, and I am greatly indebted to Dr. A. G. Bagshawe for kindly directing my attention to it. Sundstroem set out in the first place to test the effect of the various factors composing a tropical climate on the growth and fertility of mice. He compared the growth of mice that had either been brought into a hot room at an early age—as a rule at 3 weeks—or were born in that environment, with the growth of mice kept continuously at ordinary room temperature. The rôle of light and of air circulation was also studied. The tropical room was kept at an average temperature of 89° F., the wet-bulb temperature being 82·2°. Unfortunately a kata-thermometer was not employed. Mazda globes formed the source of light both in the hot and the control rooms, and the radiation from these per se was found to produce physiological effects. About 1000 animals were used. They were bred to the fourth generation and the growth studies were continued to the twentieth week. I have tabulated the results, which, in Sundstroem's paper, are expressed in tables and curves.

1. Exposure to artificial light at ordinary room temperature accelerated the growth of mice, especially of those born in that environment.
2. A stagnant hot and humid atmosphere retarded the growth of mice which were transferred to their new environment immediately after separation from their mothers—i.e., when 3 weeks old.
3. Succeeding generations of mice born in the hot and humid environment behaved differently. The first generation may develop normally, the two following may show the greatest effect of the hot climate, at least so far as growth is concerned. The effect was evidenced by an abolition of the initial stage of comparatively rapid growth while the whole curve remained low, especially for females. The fourth generation was not observed beyond the seventh week, but it exhibited a considerable rise in the growth curve, which Sundstroem believes may signify a racial adaptation.
4. Exposure to artificial light in humid heat was found to enhance the retarding effect on growth. If, however, the hot and humid air was thrown into movement the unfavourable influence of the tropical environment on growth was partly neutralised.
5. The growth of male mice was less retarded by an unfavourable environment and more accelerated by climatic factors stimulating development than the growth of females. The author comments on the fact that women suffer more from heat in the tropics than do men. Hitherto, as I have indicated, this has been supposed to be due to their indoor life and avoidance of the sun, but possibly some other explanation must be sought.
6. When the fertility of a mouse colony was normal it was not necessarily lessened by confinement in humid heat for four generations.

Attention was also directed to the relation of the body form, and especially the surface area, to the reactions released by and the resistance to a tropical climate, and it was found that retardation of growth by increasing body-surface area may serve in a tropical climate to combat overheating of the body, and that mice may, through an enlargement of their ears and tails, further improve their cooling mechanisms. Here is definite evidence of bodily adaptation, and it is possible that it also occurs in man. The Australian is certainly evolving a lengthy spare type, not unlike the typical American who, let it be remembered, has to live through hot summers even in the Northern States; a type quite distinct from the classical form we see that it is probably due in part to lack of energy or to other unfavourable effects produced directly upon the human system by climate. There is no reason for despair. We ought rather to rejoice because, perhaps, we may correct some of the evils which hitherto have baffled us." And again: "The climate of many countries seems to be one of the great reasons why idleness, dishonesty, immorality, stupidity, and weakness of will prevail. If we can conquer climate the whole world will become stronger and nobler."

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MEDICINE AND THE LAW.

Cocaine Traffic and Long Sentences.

THE record of Edgar Manning, 37 years of age, sentenced to three years' penal servitude recently at the Old Bailey for having in his possession cocaine and opium smoking instruments is instructive. It shows the type of experienced criminal with whom the police have to deal, and the lure exercised by the cocaine trade with its high profits, combined with the difficulty of detecting offenders. Manning, it was stated, came to this country from Jamaica. In 1920 he received a sentence of 16 months' imprisonment for shooting at and injuring other men in a restaurant, and at that time was trafficking in drugs and living on the immoral earnings of a woman. In 1922 a man died in Manning's flat from an overdose of heroin, believed, no doubt rightly, to have been obtained from him. In 1922 he was sentenced to six months' imprisonment for the possession of opium and cocaine after being arrested in the house of a Greek woman also carrying on business in cocaine. A woman had died in 1922 from taking drugs believed to have been obtained from him. The police stated at the Old Bailey that Manning used the drug himself, while supplying it to others. It is difficult to see what can be done with a man of this class beyond keeping him out of mischief in prison.

A Bedrid Criminal.

At Lewes Assizes Mr. Justice Avory sentenced to six months' imprisonment in the second division George Tebbutt, aged 53, who was carried into court on a stretcher and laid on a table in front of the judge. Mr. Justice Avory had already resisted all appeals made on the ground that the man was in such a state of health that to bring him up for trial would be fatal, and the magistrates who committed him had taken the evidence in his bedroom at his house. Tebbutt was sentenced protesting that his period of imprisonment would kill him, and there is no doubt that to laymen, at all events, his appearance was that of a man at the point of death. Nevertheless, it has been reported that when carried out of court he was able to raise himself and to bid a smiling farewell to his friends, and his case, which is certainly of an unusual character, should be of some interest to the prison medical authorities. His offence was the systematic obtaining of goods on credit without disclosing that he was an undischarged bankrupt, and the notepaper on which he wrote elaborate letters ordering the goods bore the motto "Audaces fortuna juvat"!

Libel on a Medical Referee.

At the recent assizes at Durham, before Mr. Justice Greer and a special jury, Dr. S. W. Plummer recovered £100 damages and costs in an action for libel against five officials of a miners' lodge, contained in a pamphlet circulated by them among the lodges of the Durham Miners' Association. The printers of the pamphlet were also defendants and apologised, pleading ignorance of its contents. The pamphlet was directed against Dr. Plummer in the performance of his duties as medical referee with regard, in particular, to a report made upon a young miner whose wrist had been injured in an accident. Dr. Plummer had reported inter alia that the lad had a permanent disability and "is unable to make full use of his left hand and his condition is such that he is fit for employment as a pony putter, but he could not do heavier work which involved the full use of his left hand." According to the defendants' contention pony putting was the heaviest work in the mine, and the pamphlet, after accusing the plaintiff of lack of practical experience and of making a "ridiculous" report, concluded "we respectfully ask your members to help us to turn this man off the medical referees' list." These concluding words were held by the judge to be for the jury's consideration as evidence of malice, and he therefore allowed the case to go to the jury, after having ruled that the occasion of the publishing of the pamphlet was privileged. Dr. Plummer is to be congratulated, and it seems hardly necessary to add that it is a grave hardship upon medical referees that attacks of the kind described should be made upon them by parties displeased with their reports, whether such parties be workmen or their employers.

Interpretation of Skiagrams.

In an action for damages for negligence a plaintiff at Birmingham Assizes, who had been injured by a motor-van, was stated to have suffered from a fractured skull. Photographic prints were adduced as evidence in support of this when a question arose as to what these revealed. A medical man, called on behalf of the plaintiff, gave evidence that they showed a fracture of the skull. Another medical man, a radiographer, was of the opinion that no fracture was proved by the illustrations, and that the lines pointed to as indicating fracture were blood-vessels. He also spoke of the difficulty at times of drawing correct deductions from such photographs. The jury eventually awarded the plaintiff £350 damages, so presumably they preferred to rely on the evidence of more serious injury, but, of course, the views of a jury are not conclusive as to scientific evidence. The point is interesting as showing that photographs that are at all obscure should, if possible, be supplemented by fresh negatives.

RESEARCH ON PARASITES OF THE COTTON PLANT.—The Empire Cotton-growing Corporation has offered to the University of Manchester and three other institutions for a period of five years a grant to promote study of and research in mycology and entomology, with particular relation to diseases caused by animals and plant parasites of cotton. The Council of the University has accepted the offer and has appointed Mr. Samuel Wilkins, M.Sc., to supervise the department of plant diseases, and Mr. R. A. Wardle, M.Sc., to supervise investigations in entomology.

lands within the tropic zone, I would not like to hazard an opinion. Remember that it was not until the fourth generation that Sundstroem's mice showed possible signs of adaptation. Like Mr. Asquith and Dr. Steudel [1] we must wait and see, but I confess that I recall with foreboding what Havelock Charles [50] has said about the deterioration of various strains of domestic animals and even vegetables introduced from Europe to India. I only wish for once in a way I had the cheery optimism of the man who, having heard that ravens lived to be 200 years old, bought one to see if it was a true bill. In, say, 150 more years of life one might come to valuable conclusions regarding Kenya and North Queensland.

It is, however, more profitable to consider if anything can be done to favour acclimatisation, apart from dealing with insect-borne and other diseases, and beyond considerations like those involving suitable clothing, suitable habits of life, the use of fans, and so forth. By the way, we are inclined to think that we have discovered the true value of all these aids to comfort, but here is what the ingenious Dr. James Johnson[51] wrote in 1813, when comparing conditions in the West Indies with those in Bengal.

> "With respect to officers, and other genteel classes of society, on landing in the Western world, they are destitute of many powerful shields which are pretty generally interposed between Europeans in the East and the burning climate. In the former case, we may look in vain for the palankeen, the budgerow, the punka, the tatty, and the light, elegant, and cool vestments of India, together with the numerous retinue of domestics, anticipating every wish, and performing every office that may save the exertion of their employers. The untravelled cynic may designate these luxuries by the contemptuous epithet of 'Asiatic effeminacy'; but the medical philosopher will be disposed to regard them as rational enjoyments, or rather as salutary precautions, rendered necessary by the great difference between a temperate and torrid zone."

His whole chapter on personal tropical hygiene is well worth reading. But to hark back to hygienic measures on the big scale: The provision of good and palatable food in abundance and presenting sufficient variety is of primary importance and will in part form the theme of my next lecture. I have been wondering if the comparatively excellent dietary available in Mauritius has something to do with the retention of vigour by its white inhabitants. Housing and town planning on scientific lines must receive attention. Guiteras[52] suggests that one reason why the Spaniard has fared better in the tropics than other Europeans is because he knows how to house himself. Certainly he contrives to keep his house cool and dark, but unless he possesses a fan or punkah he lives in a stagnant atmosphere, as he closes his windows and has no other means of ventilation. I am inclined to think that the methods advocated by Crossland [53] are better, at any rate in places where a breeze is obtainable. His experience was chiefly gained on the stifling Red Sea littoral, and he has recommended the provision of sliding louvred shutters inside the glass frames of the windows and sliding doors louvred at the bottom so that, the slats being set at an angle of 45°, the wind is deflected upwards by them and reaches the face and body of anyone seated in the room, thus *making for coolness*. I note that Hewetson [54] is strongly opposed to the one-storied bungalow, and I agree with him that, wherever possible, it is advisable to get away from the ground. The best tropical house in which I have ever lived was that once occupied by the German medical officer of health at Dar-es-Salaam, and it possessed two stories.

It is, however, scarcely necessary to consider details. We know how to build cool houses suitable for the tropics, though very often we fail to do so, partly because they cost money. Even so, with careful orientation, choice of material, and good design, the best house is only relatively cool. But while the architect has gone as far as he is likely to get, the engineer is far from being at the end of his resources. Air conditioning, as it is called, developed chiefly in America, is a process of so-called "weather manufacture" which is bound to progress. Hitherto it has been chiefly applied to industrial buildings, but it has been used in connexion with laboratories and hospitals in the United States. It is not only a question of cooling air but of dehumidifying it. Indeed, so long as the atmosphere to be treated is under control—that is to say, in a confined space—it can be altered to suit requirements. Of course, such a system requires a large plant, and is costly. In the tropics it could only be applied generally in towns and cities, but there seems no reason why in the future such a system should not be adopted. One would not aim at uniformity of temperature even indoors, for what is required is change within reasonable limits, but surely this is not beyond the genius of the engineer to compass! We may look forward to the day when there will be a central station which will provide cool, dry air to European dwellings, the latter being provided with regulators so that whatever temperature and humidity is desired can be obtained. Chill must, of course, be avoided. For isolated houses, the compressed-air douche advocated by Prof. Hill[55] may yet be feasible. It would mark a great step in advance. Moreover, as transport conditions improve there will be large and periodical movements of people from hot, low-lying regions to cool uplands which are attainable in many parts of the tropics. The change from the plains to the hills means much in India, and a similar change should yet be possible in many other places, not only for the wealthy but for all classes of the white sojourners in hot countries. People have yet to learn that prevention is better than cure, and what huge sums can be saved in hospital upkeep and devoted to better and saner purposes. Time lost through illness and inefficiency means money wated, and there has yet been little organisation of public health on a communal basis in the tropics.

Can we alter climate as well as defeat it in some measure? Who can say? We are only beginning to realise what electricity can accomplish, and, as I have hinted, it is conceivable that by its powers we may be able to bring about much-needed and welcome local reductions in temperature. Stranger things have happened, though at present it may seem a vain dream. As Hintze[56] says, there is a great future for mechanical means in the tropics. The white settler should drive machines rather than do work with his own muscles. If so, however, he must not neglect the necessary daily exercise. Much can be accomplished by more careful selection of those destined for the tropics, by choosing suitable sites for first settlement, by regulations as regards the time of marriage, by general forethought and foresight. At present we are haphazard in our arrangements and suffer accordingly.

Above all, there is the need of stimulus—not necessarily climatic in nature. Almost any stimulus is good provided it is not alcoholic. There is the necessity for work, contact with other races, idealism as to the future, and so forth. There is a hygiene of the mind as well as of the body, and methodical and systematic intellectual exercises will do much to prevent mental staleness and brain stagnation. It is interesting to speculate as to what the influence of broadcasting will be in this direction. It should diminish the sense of isolation, it should lend interest to life, it should quicken and revivify the cerebral centres.

If all these measures fail to render the white race more than sojourners then there is nothing for it but the half-breed, an adaptation not perhaps to be desired, but which has undoubtedly done much for tropical South America and which is possibly Nature's way of overcoming the difficulty. Yet in many directions Science has conquered Nature, so why should it fail in this particular, complex though the problem be? I began with Huntington.[9] Let me end with him, for he ends on a high and hopeful note. "Hitherto," he says, "we *have attributed our failure* to economic conditions, to isolation and remoteness, to racial incapacity, or to specific diseases. Now

Not only is the matter of child labour involved here—and many quite young children are found to be working—but the sanitary conditions of these home factories are sometimes found to be very deficient. Mr. Charles A. Weeks, Deputy Commissioner of Labour for New Jersey, states in an interview that his attention has been called to several pathetic cases where parents living in Jersey City and Hoboken have been working long hours in dingy, ill-lighted, and unsanitary rooms, and that in some instances children hardly old enough to handle the work have been pressed into service. Legislation in this case is unnecessary since the New Jersey State law provides a penalty of $50 for the unauthorised use of private rooms for homework of any industrial nature. The law further provides that rooms so used shall have no door, window, or other opening into adjoining living rooms, and that these rooms shall not be used at any time for living, cooking, or sleeping purposes.

Medicine in Industry.

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In estimating the financial return of a health service two principles were emphasised. In the first place all results are not tangible; in the second place, while certain maintenance charges in connexion with health supervision are chargeable as production and should be passed on to the consumer, others should be offset by savings in materials, labour turnover, absenteeism, continuity of production, and the like. The maximum of benefits will not be attained within three or four years.

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Medical Relief.—During the year new municipal dispensaries were opened at Vellore, Pollachi, and Calicut, and the hospital at Tirupati was converted into a dispensary. Two dispensaries at Udamalpet and Proddatur were closed. The councils maintained 54 hospitals and 44 dispensaries. The councils of Anantapur, Chingleput, Chittoor, Cuddapah, Mangalore, and Kurnool have no medical institutions, the towns being entirely dependent for medical relief on the district headquarters hospitals maintained by the Government or on private enterprise. The only municipalities which have no hospitals of any kind are Walajapet, Saidapet, Tirupati, Palakole, and Sivakasi. There were health officers throughout the year in the municipalities of Coimbatore, Calicut, Ootacamund, Tuticorin, and Trichinopoly.

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Maternity Relief.—The councils employed 134 midwives, against 110 in 1920–21, as now reported, and the number of cases treated by them arose from 11,745 to 12,553, an average of 93 per midwife. In addition, 135 midwives were practising privately and attended 6080 cases. In all about 25 per cent. of births were attended to by qualified midwives. There are no midwives at all in Cuddapah and Salem, and in most councils this service does not receive proper attention, the staff employed being utterly inadequate. On the other hand, Mangalore has 21 trained midwives, nine of whom are employed by the municipality, who between them attended 75 per cent. of the recorded births; Trichinopoly employs six midwives, in addition to 20 other qualified midwives in the town, and the number of confinements which received skilled attention rose by about 65 per cent. For these good results the councils are indebted chiefly to the District Health and Welfare Association at work in these places.

Death-rate.—Public health was worse than in the previous year, the rate reported being 27·2 per mille, against 21·8. Gudiyattam and Bezwada head the list with 47 and 41 per mille respectively. The mortality figures for epidemic diseases are as follows: Cholera, 1861; small-pox, 1687; plague, 2151. As regards cholera, the towns with a protected water-supply did well. Apart from Cocanada, which had 117 deaths in a part of the town where piped water was not accessible, eight only showed a mortality of more than 20. There were in all 634 deaths from cholera in the 28 protected towns, and 1227 deaths in the remaining 52, the rates per mille being, protected 0·2, and unprotected 0·5. As anticipated, the small-pox epidemic assumed a severe form, being highest in Madura (466 deaths). Vaccination only slightly improved, the number of successful primary operations rising from 80,124 to 81,161, and the number per mille of the population from 32·0 to 32·4. Revaccinations increased from 26,797 to 28,360. Plague was less virulent than in 1920–21, the death-roll falling from 4914 to 2151. Influenza was responsible for 372 deaths, against 481 in the previous year.

Sanitation.—The conservancy charges rose by Rs.1·05 lakhs over that of 1920–21, the average expenditure being nearly As.9–10 per head. Private scavenging was self-supporting in 16 municipalities. The number of private latrines increased by 18,699, and the number of houses conserved by 17,685. These figures are disappointing.

Water-supply.—Twenty-eight towns in the Presidency possess a protected water-supply; in three towns new installations are under construction, and schemes have been sanctioned for four others. The present financial position makes it impossible to expect great and rapid progress in this matter.

The average consumption of water ranges from 51 gallons per head in Tirupati (no other town consumes more than 15 gallons per head per diem) to nearly 4 gallons per head in Berhampur and Guntur. Financially, the water-supply fund for all the 29 towns taken together shows a plus balance of Rs.0·80 lakh.

TUBERCULOSIS.

Annual Report of King Edward VII. Sanatorium, Midhurst.

ON the cover of this report, which deals with the period July, 1921–July, 1922, it is stated that the charge per week has been reduced as from April 1st, 1923, to 4 guineas. This is most satisfactory and greatly to the credit of the persons concerned. Some instructive figures are published with regard to sputum tests. Of the 363 patients whose sputum was examined, 271, or 75 per cent., proved to be sputum-positive, and a comparison of the naked-eye appearance of the sputum with the microscopic findings showed that when typical, purulent sputum was examined, tubercle bacilli were demonstrable in 93·5 per cent., whereas they were found in only 17 per cent. of the watery, poor samples of sputum. Among the 271 sputum-positive cases there were 227 in which tubercle bacilli were found at the first examination, 26 on the second examination, eight on the third, and ten on subsequent examinations up to the twelfth. The interesting calculation is made that if, in a suspicious case of tuberculosis, three examinations of the sputum for tubercle bacilli yield negative results, there still remains roughly a 1–27 chance that the bacilli may be discovered on subsequent examinations during the following three months. Some of the most modern methods for treating tuberculosis in a sanatorium do not seem to be in favour at Midhurst, and the table of cases treated by artificial pneumothorax in the period under review deals with only four cases. Apparently one of the contra-indications to this treatment at Midhurst is the prospect that the patient may be unable to have "re-fills" after leaving the sanatorium.

Annual Report of Vejlefjord Sanatorium, Denmark.

The twenty-third report of Vejlefjord Sanatorium covers the period Jan. 1st–Dec. 31st, 1922, and opens with a brief obituary notice of Prof. Saugman, the creator and presiding genius of the sanatorium. Of the 145 patients discharged from the sanatorium during 1922, 129 were suitable for statistical investigations. About 56 per cent. were in the third stage, and 31·9 per cent. were confined to bed. The average duration of treatment was 208 days, and 48, or 37 per cent., of the patients were febrile on admission. Of these 48 patients, 39, or 81 per cent., became afebrile after an average interval of 50 days. Of 23 patients whose maximum rectal temperature was between 37·8° and 38° C., 21 became afebrile after an average interval of 34 days, whereas of 20 patients, whose maximum rectal temperature was between 38·1° and 39° C., 14 became afebrile after an average interval of 64 to 65 days. Some explanation for these remarkable results may be found in the section of the report dealing with the various methods of treatment adopted at Vejlefjord. Of the patients discharged in 1922, 40 were selected for pneumothorax treatment, which in 17 cases had to be abandoned on account of pleural adhesions. Fourteen underwent thoracoplasty, and one apicolysis with fat transplantation. Fifteen were treated with quartz-mercury light, and 31 with carbon arc light. X ray treatment of the spleen was undertaken in five cases, and local, Finsen-Reyn light treatment or Bacmeister's combined X ray and quartz-mercury-light treatment was given occasionally. Heliotherapy was given only in three cases, and these were, presumably, cases in which the disease was mainly surgical tuberculosis. An item of news which does not appear in this report is that Dr. Gravesen, a former assistant of Prof. Saugman's, on whom his mantle has fallen, was reading a paper on the surgical treatment of pulmonary tuberculosis on July 25th at the annual meeting of the British Medical Association.

The Grancher System of Infant Prophylaxis: Five Hypotheses Relating to Tuberculosis in Infancy.

A paper by Léon Bernard and Robert Debré in *Annales de Médecine* for May, 1923, gives an instructive account of the elaborate organisation established in Paris for isolating infants at birth from tuberculous surroundings. The expectant tuberculous mother is confined in some maternity hospital with which the central tuberculosis organisation coöperates. The mother is instructed beforehand as to the facts of the situation, and her consent is obtained for the removal of her infant directly after birth. Even when only the father is tuberculous, it is usually desirable to remove the infant at once to uninfected surroundings unless the father leaves the home to enter an institution for the tuberculous. If he does not, and the healthy mother attempts to combine wage-earning and the care of her infant, the odds are that it will suffer.

Prof. Bernard and his collaborator enunciate five hypotheses—laws, they prefer to call them—dealing with the pathology of infection with tuberculosis in infancy. The first three are fairly well established, the two last are at any rate very interesting and suggestive. (1) The fate of the infant depends on its age at the time of infection. Of five infants, less than 15 days old when removed from exposure to infection, all died, whereas of 41 between the age of 6 and 18 months at the time of removal, only 10 died. (2) The next most important factor is the duration of exposure to infection. The authors compare the duration of such exposure among 33 infants who escaped contamination with the duration of exposure of 86 infants who were found to be contaminated, and the figures published show that, as a rule, the longer the exposure, the higher the rate of tuberculosis among infants. (3) Intimacy of contact also plays a part, and the authors refer to statistics published elsewhere in support of this hypothesis. (4) There is a definite relation between the gravity of the disease in infancy and the duration of the "ante-allergic" period—the incubation period or interval between the moment when exposure to infection ceases and the cuti-reaction becomes positive. The shorter this period, the more serious is the disease. (5) There are exceptions to this fifth law, but they are not common enough to invalidate it. It concerns the duration of life of the infant after exposure to infection has ceased. The authors have never observed an infant who lived for six months after exposure to infection ceased and then died of the disease. Of 36 infants dying of tuberculosis, 30 died within a month of isolation from infection by a mother or father, one died two months after isolation, one four months after, and one five months after. In other words, an infant who is still alive a month after removal from an infectious parent has excellent chances of survival.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Industrial Hazards of Children.

A RECENT report by the Bureau of Women in Industry drew attention to the frequency of accidents to children who are employed in defiance of the law. Thus in a single year 44 children were found to have suffered injuries, involving at least a fortnight of invalidity, none of them being of the legal age in their respective employments. One boy of 11 had his hand crushed while operating an electric ice-cream freezer; another boy, only a year older, lost two fingers in feeding meat into an electric chopper. A Bill designed to prevent this illegal employment of children has been introduced into the New York State legislature. If passed it will provide double accident compensation and double death benefits for all children illegally employed.

Since July 9th a large force of New Jersey State inspectors have been investigating the conditions under which home industries are carried on. It appears that the distribution of work by New York manufacturers has been growing to very considerable proportions.

Not only is the matter of child labour involved here—and many quite young children are found to be working—but the sanitary conditions of these home factories are sometimes found to be very deficient. Mr. Charles A. Weeks, Deputy Commissioner of Labour for New Jersey, states in an interview that his attention has been called to several pathetic cases where parents living in Jersey City and Hoboken have been working long hours in dingy, ill-lighted, and unsanitary rooms, and that in some instances children hardly old enough to handle the work have been pressed into service. Legislation in this case is unnecessary since the New Jersey State law provides a penalty of $50 for the unauthorised use of private rooms for homework of any industrial nature. The law further provides that rooms so used shall have no door, window, or other opening into adjoining living rooms, and that these rooms shall not be used at any time for living, cooking, or sleeping purposes.

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Drainage.—Only one town has a completed drainage system, and in two, Madura and Vellore, drainage-works are still under construction. Schemes are under discussion in no less than 25 towns, but want of funds is generally holding these up.

Government, in concluding their review, state that municipal councils evidently do not realise that in the depressed state of their finances they cannot afford to be tardy in the collection of their tax revenue or indifferent in remission or writing off of bad debts. Many irregularities have been brought to notice by the local fund auditors.

Relapsing Fever in Madras Presidency.

The Madras Presidency has until recently been, as far as is known, entirely free from relapsing fever, but towards the end of 1921 reports of cases began to be sent in to the Public Health Department, and eventually, on investigation, it was found that infection was widespread in certain districts. The first report on the subject was sent by the Director of Public Health to Government on Nov. 17th, 1922, and the Government have recently published the report along with their remarks. The Government review sums up the situation as follows: In February, 1922, the Presidency was regarded by research specialists as immune from relapsing fever, but in the following month reports were received of the occurrence of a new and deadly epidemic in the district of Tanjore. Relapsing fever had been widely prevalent in the Mysore State for some time past, and an outbreak occurred in the adjoining plateau taluk of Hosur in Salem district in October, 1921, but its scope was limited. The Tanjore outbreak, the origin of which it is impossible to trace, stands on a different footing. An elaborate investigation by the Public Health Department revealed the fact that this disease had established itself in the districts of Tanjore and Trichinopoly for seven months before it was detected by the authorities locally responsible for public health administration. The disease was restricted almost exclusively to the Paraiyar and Pallar communities; neither the local village officers, nor the landlords in whose service the Paraiyars and Pallars are employed, bestirred themselves to combat it, but the victims realised the character of the epidemic sufficiently clearly to describe it as "Paraiyars' fever," attributing it to the pollution of a sacred tank in Kumbakonam by a Paraiyar, and realising that its virulence could be abated by the simple expedient of shaving the head.

The Director's report establishes the following three points of supreme importance in public health administration:—

(*a*) Closer vigilance over vital statistics would have enabled the Public Health Department to take steps to stamp out the disease at its outset. The Director's diagrams show very clearly the existence in these villages of an abnormal prevalence of "fevers" in August and September, 1921, rising to a maximum incidence in the period December, 1921, to March, 1922. The report proves by corroborative evidence that this rise in mortality was due to relapsing fever, and that the worst was over before the disease was correctly diagnosed. The statistics also reveal the facts: (1) that adults of from 20 to 40 years of age are most susceptible to infection, while its incidence among very young and very old is comparatively light; (2) that women are somewhat more susceptible to infection than men.

(*b*) The impossibility of tracking down an epidemic of this kind unless the local health authority is equipped with a properly trained preventive staff. Only by intensive local investigation can the public health authorities locate the districts infected and take steps to eradicate the disease. The essential fact was that infection was confined to certain specified villages and to certain communities. The need for the appointment in every district of district health officers with a properly trained staff is amply justified, and when the complete scheme sanctioned comes into operation, it is inconceivable that so large an epidemic as that now under review can again run its course without detection.

(*c*) The third point is the importance of accurate knowledge. The actual diagnosis of the cause of the trouble was made in the first instance by the examination of blood smears, at first in the Tanjore Medical School, but the work of a mobile unit of the King Institute staff organised to examine the disease in situ met with a success impossible in the absence of such a unit. It is satisfactory that in the reorganisation of the King Institute provision has been made for field units as a permanent accessory to the Guindy staff.

The Director estimates that out of 9060 attacks for which relapsing fever was accountable, no less than 3382 ended fatally. This gives a mortality rate of 37·3 per cent., but in some villages two died out of every three persons attacked, while in a considerable number of villages infected from 70 to 80 per cent. of the population suffered from the disease. In many households the whole family was wiped out. That the spread of infection is due to overcrowding and dirty habits was shown by the almost complete immunity of the higher castes living in close proximity to infected hamlets.

Since the submission of this report the disease has spread to other districts, and will probably gradually extend its ravages all over the Presidency. Preventive measures, while simple, are by no means easy to carry out in a population of 42 millions, although it has been possible in small areas to get considerable numbers of both males and females to shave their heads. The treatment of thousands of individuals living in remote villages in the mufussal with drugs like salvarsan is, of course, out of the question. The position is very serious.

Health Propaganda and Voluntary Associations.

The Government have just published an Order which contains the following paragraphs:—

"The better organisation of public health propaganda and the coördination throughout the Presidency of the work of voluntary health associations have engaged the attention of the Government for some time past. In a previous Order a programme was laid down for the coördination of health work through the medium of district health committees, and with effect from April 1st, 1923, each district will have a health officer. Practical experience has also been gained of the possibilities of propaganda work in the mufussal by the deputation of four assistant surgeons early in 1922 on lecturing tours in a number of districts. The Director of Public Health's report attached as an annexure to this Order is a most convincing testimony to the value of such work."

"On the non-official side the cause of public health has been greatly strengthened by the reconstitution of the Health and Welfare Association and the distribution of its functions between two separate organisations: (1) the Health Propaganda Board, and (2) the Maternity and Child Welfare Association, Madras, which is affiliated to the Lady Chelmsford All-India League. This association had. even before the reconstruction of the Health and Welfare Association, greatly expanded its activities both in the mufussal and also in Madras City, working in the latter area in close coöperation with the health centres of the Madras Corporation. The corporation health centres have now received definite recognition as a Health Visitors' Training School for the Presidency. A wide field has also been covered by the hookworm propaganda work of the Rockefeller Foundation."

"The Government have now before them two documents which they hope will give cohesion and permanence to activities which hitherto have been somewhat discontinuous. The first is a 'Memorandum on Propaganda and Voluntary Health Work,' drawn up by the Director of Public Health, while the second document is a 'Memorandum on the Future Policy of the Health Propaganda Board.'"

The Director in his memorandum discusses the great need for propaganda work in the present state of ignorance and apathy of the people, and lays down a definite plan of campaign, at the same time outlining the official and non-official agencies already in existence. The third section of the memorandum describes the activities of the Public Health Department in connexion with the giving of popular health lectures. These lectures were given by qualified assistant surgeons and are reported to have been most successful. It is regretted that the small grant for this piece of propaganda work was cut out of the current year's budget. The fourth part of the memorandum mentions the bodies of voluntary workers, &c., at work in Madras city and in the mufussal, and discusses the various ways in which these bodies may be utilised by a central propaganda organisation. Finally, a detailed programme of work is suggested, this programme including campaigns for prevention of hookworm, plague, small-pox, cholera, malaria, tuberculosis, venereal diseases, for child welfare and maternity relief work, &c. The Health Propaganda Board is felt to be the body best suited to form the necessary link between the State and local bodies on the one hand, and on the other the various voluntary associations and societies. It is suggested that representatives of the various official and non-official agencies should be elected to this Board, so that a more or less complete coördination could be obtained. On the official side the Director of Public Health, representing the Public Health Department, the Director of Public Instruction, representing the Educational Department, and the Director of the King Institute, representing the Medical Department, should be coöpted members of the Board.

The memorandum on the future policy of the Health Propaganda Board, written by Major J. Cunningham, I.M.S., is also printed with the Government Order. This memorandum discusses a scheme for the organisation of public health propaganda from the non-official point of view, and while laying down certain general principles in connexion with health propaganda which require consideration before the actual organisation of the central body can be discussed, it reaches conclusions which are not at variance with those promulgated by the Director of Public Health. It is suggested that the Health Propaganda Board could best carry out its functions as the central organisation for health propaganda by means of two subcommittees which, for want of better names, could be known as (1) the technical, and (2) the administrative. These two committees would in no sense be water-tight compartments, but would work in the closest coördination with each other.

The Government do not discuss these two memoranda in detail, but suggest that they deserve careful study. The Government admit the necessity for a central agency to coördinate the efforts of the numerous bodies interested in public health propaganda, but defer the question of financial assistance, as they understand the formation of such an agency is under consideration. The recent visit of Sir Claude Hill, the Red Cross Commissioner for the League of Nations, has stimulated interest in the international activities of the Red Cross Society in public health propaganda.

CONGRESS OF THE ROYAL SANITARY INSTITUTE AT HULL.

THE Thirty-fourth Congress of the Institute, which opened at the beginning of the week, bids fair to be exceptionally successful, attended as it is by over 500 delegates from this country and a large number of overseas representatives. On Sunday, July 29th, Canon George Buchanan preached a striking sermon to the members of the Congress, in which he developed the theme that health and wholeness implied the same thing, and to secure real health every section of the community and every phase of social life must be reached.

On July 30th the Lord Mayor of Hull received the members and delegates and later on opened the Health Exhibition in the Wenlock Barracks, a building admirably adapted for the purpose. At 5 P.M. the Right Hon. T. R. Ferens, High Steward of Hull, President of the Congress, delivered the inaugural address, Dr. Louis C. Parkes, Chairman of the Council of the Institute, being in the chair. Mr. Ferens made special reference to housing as the greatest need of the nation to-day. Hull needed approximately 6000 more houses. It was no use, he said, attempting to instil the precept of hygiene into people who live in the many dilapidated and insanitary dwellings which to-day exist in the slum areas of all our towns and cities. As a contrast, Mr. Ferens invited the members to visit the well laid out garden village in East Hull, covering an area of 60 acres and containing 600 houses; marked improvement in health was the result of life there. Mr. Ferens also alluded to the social and hygienic work in connexion with a factory in East Hull, where over 5000 workers of both sexes are employed. Here, during the past 15 years, a whole-time doctor and a whole-time dentist have been engaged, and may be consulted at any time. Nurses are provided, and are in charge of dressing and rest rooms for casualties and slight illnesses. There are health visitors who become acquainted with home conditions of the workers. Boys and girls under 18 are taken from their work two hours weekly for drill and gymnasium at the company's cost. Dental work has proved most beneficial in the maintenance of general health; tooth-brushes and tooth-powder are bought wholesale and supplied at cost price. Applicants for employment are examined by the doctor as to their suitability for factory work. The medical examination is on very broad lines and rejections are few, consisting of those suffering from epilepsy, oral sepsis, tuberculosis, and certain heart cases.

At the conclusion of his address a vote of thanks to Mr. Ferens was proposed by Lieut.-Commander J. M. Kenworthy, M.P., and seconded by Surgeon W. W. King, of the United States Public Health Service, on behalf of the delegates from Foreign Governments. The motion was also supported by Dr. J. E. Sandilands, Executive Health Officer of Bombay, on behalf of the delegates from the Dominions, by Dr. S. J. Thacker, ex-Mayor of Christchurch, New Zealand, and by Judge W. J. Harvey, of Edinburgh, on behalf of the delegates from Municipal Authorities, and was put to the meeting by Mr. H. D. Searles-Wood, chairman of the Institute's Congress Committee.

The meetings of conferences and sections are proceeding as outlined in THE LANCET of July 21st (p. 152). Elsewhere in the present issue appears the text of Prof. F. E. Wynne's address, delivered before the Section of Maternity and Child Welfare on August 2nd. A large number of firms are displaying apparatus, materials, and preparations of interest to all concerned in hygiene and sanitation.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. H. A. L. Guthrie to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Temp. Surg.-Lt. W. F. W. Betenson, late R.N., to be Surg.-Lt. (Permanent List).

Surg.-Capt. R. J. E. Hanson is placed on Retd. List at his own request.

TERRITORIAL ARMY.

Capt. A. W. Wakefield (late Canadian A.M.C.) to be Capt.

A. H. MacCulloch Eaton (late R.N.V.R.) to be Lt.

Capt. F. E. Tylecote relinquishes his commn. and is granted the rank of Maj.; and Capt. J. Macquarrie resigns his commn. and retains the rank of Capt.

Sanitary Companies: Capt. R. Cunningham (late R.A.M.C., Mila). to be Capt.

INDIAN MEDICAL SERVICE.

Col. Charles Harford Bowle-Evans, V.H.S., C.M.G., C.B.E., has been appointed Director of Medical Services in place of Lieut.-Gen. Sir C. H. Burtchaell, C.H., K.C.B., C.M.G. This is the first time that an officer of the I.M.S. has been appointed to be Director of Medical Services, and we congratulate all concerned on the departure.

The King has approved the retirement of Maj.-Gen. Sir William Rice Edwards, K.C.I.E., C.B., C.M.G., K.H.P.

THE Lancashire Asylums Board has decided to apply under a Bill now before Parliament for the name to be changed to "Lancashire Mental Hospitals Board."

ELEVENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS.

THE Eleventh International Physiological Congress met in Edinburgh from July 23rd to 27th, under the presidency of Sir **EDWARD SHARPEY SCHAFER.** We referred in the last issue of THE LANCET to the opening of the Congress,[1] at which were present members representing over 20 nationalities. The proceedings included a graduation ceremony, at which the honorary degree of Doctor of Laws of the University of Edinburgh was conferred on the following distinguished members of the Congress: Profs. F. Bottazzi (Naples), W. Einthoven (Leiden), W. H. Howell (Baltimore), J. E. Johansson (Stockholm), A. Kossel (Heidelberg), H. H. Meyer (Vienna), Ivan Pavlov (Petrograd), and C. Richet (Paris).

At the opening session, following the official addresses of welcome on behalf of the Government, the city and University of Edinburgh, and the President's address, Prof. J. J. R. **MACLEOD**, of Toronto, delivered a lecture on insulin, which we published in an abridged form in our last issue.[2] A large number of other papers were devoted to various aspects of this subject. The programme was so varied and extensive that thoughout the meeting communications had to be delivered in three lecture theatres concurrently. Physiology has now become so highly specialised that many of the subjects dealt with appealed only to a small group of experts; but there were also a large number of communications which were not only of more general scientific interest, but which had a very direct bearing on the problems of clinical medicine.

Physiology of the Nervous System.

In the sections concerned with the physiology of the nervous system the question of the possible sympathetic innervation of voluntary muscles formed the subject of several papers. On the whole the tendency of the meeting was to regard the case as not proven; several workers (including Profs. Bottazzi and Hess) reported that they had been unable to find that interference with the sympathetic system had any effect on either the tone or the nutrition of skeletal muscle. One of the most interesting demonstrations was given by Prof. R. Magnus (Utrecht) on the postural reflexes due to the labyrinth and mid-brain. Prof. Magnus showed how the balancing and "righting" reactions can be analysed into a series of simple reflexes by the use of guinea-pigs and rabbits with the cerebrum removed. The clinical importance of these reflexes has been pointed out recently by Dr. F. M. R. Walshe, and their interest for the neurologist is increased by Dr. G. G. J. Rademaker's demonstration of their connexion with the red nucleus and cerebrospinal tract. In the cinematograph exhibits Prof. G. P. Zeliony (Petrograd) sent a film showing the behaviour of a dog three years after complete removal of the cerebral hemispheres. This animal illustrated certain phenomena which had not been observed by Goltz in his classical experiment, and the central nervous system in general exhibited extreme irritability. When played with the animal behaved in the manner characteristic of a puppy, lowering itself on its front legs, wagging its tail, and continuing to run and jump about.

Prof. A. **KROGH** (Copenhagen) gave a very beautiful cinematograph demonstration of the capillary circulation in various organs of the body. The film itself was a triumph of technique and gave a very vivid picture of the conditions under which gaseous exchange in the tissues takes place.

Physiology and Psychology.

In a most suggestive lecture entitled "Les voies non sensorielles de la connaissance et la méthode expérimentale," Prof. **RICHET** dealt with the borderland of physiology and psychology. He began by warning his audience that the matter which he was about to put before them was of a very revolutionary nature, and was likely to meet with vigorous opposition; but he contended that many of the most distinguished physiologists of the past had been great revolutionaries, in that they had faith in the experimental method, and had rejected the theories and concepts of all those who refused to take experimentation for their guide. His thesis was to prove by the experimental method that there were for the knowledge of reality other channels than the normal sensory channels. It was thought that we could not comprehend reality by other means than by the five senses, that a circumstance would remain still unknown to us, if sight, touch, and hearing had not revealed it. That was the classic idea. To admit, for one moment, that consciousness could grasp a circumstance by means other than the senses, was an idea which would be regarded as revolutionary. He suggested the hypothesis that the events of the external world could actuate our intelligence in some other way which was not at present understood, by a hidden form of sensibility which he termed "cryptesthesia." He asked his audience to consider a similar example. They were not conscious of any music in the room where he was speaking. They heard nothing and could almost affirm that there were no musical vibrations there. But if they took the receiver of a wireless telegraph apparatus, everybody might hear a concert which was proceeding miles away. It sufficed to get a receiver to prove that there were such vibrations in their midst. Similarly there might be ways open to our consciousness other than the familiar way of the senses. In considering such possibilities, scientific investigators should not let themselves be prejudiced by the credulity of the spiritist. He would like to see the facts, which depended on observation, investigated experimentally.

Physiology of the Cardiovascular System.

In the section dealing with the physiology of the cardiovascular system, Prof. C. J. **WIGGERS** (Cleveland) demonstrated some very beautiful instruments which he had used for making optical records of the heart sounds in man, and of the pressure changes in the heart of animals. In a series of experiments dealing with the dynamics of premature ventricular contractions in the dog produced by artificial stimulation, he had found that the volume of blood discharged from the ventricles varied with the time available for ventricular filling and with the intraventricular tension, the latter factor depending not only on the duration of diastole, but also on the rate of venous filling of the heart.

Dr. J. **CRIGHTON BRAMWELL** and Prof. A. V. **HILL** (Manchester) demonstrated a very sensitive recording instrument, the "hot-wire sphygmograph," which they had used for measuring the velocity of the pulse-wave in man. From these observations they were able to determine the elasticity of the arteries in the living body, and to investigate the variations in arterial elasticity met with in different pathological conditions. This instrument had also been employed for recording muscular tremor.

Dr. **JANE SANDS** (Philadelphia) showed a series of X ray photographs, illustrating alterations in the size and shape of the dog's heart, following artificially induced aortic regurgitation. Immediately after operation the heart appeared longer and narrower. Later the size of the heart shadow was increased and displaced leftwards, but electrocardiographic examination did not show any evidence of left ventricular preponderance.

Nervous Activity and Heredity.

At the concluding session of the congress Prof. **PAVLOV**, in the course of a paper dealing with inhibition, described some extremely interesting and important experiments on conditioned reflexes. He pointed out that in this connexion a question of the greatest importance was whether the highest nervous activity—that is to say, individual perfection—might be of use to the next generation. Was it hereditary? They had tried to find the answer to that question, and had established the conditioned food reflexes in white mice, using the sound of an electric bell. With the first set of wild white mice it was necessary to repeat the combination of ringing the bell and feeding 300 times, in order to form the well-established reflexes. The next generation formed the same reflexes after 100 repetitions, the third generation after 30, the fourth generation after 10, and the fifth after 5 repetitions only.

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[1] THE LANCET, July 28th, p. 183. [2] Ibid., p. 198.

Public Health Services.

THE HEALTH OF LONDON IN 1922.

Sir William Hamer's annual report as medical officer of health and school medical officer to the London County Council is so full of interesting matter that our first obvious duty is to point out that copies can be obtained (price 2*s.* 6*d.*) from P. S. King and Sons, Limited, Westminster. The death-rate of London was 13·5 in 1922, to be compared with 12·5 in 1921. The infant mortality rate was 75, and Sir William Hamer submits a table showing that a remarkable fall has taken place in the mortality from premature birth and congenital defects during the past three years. It is suggested that the replacement of the unqualified midwife, maternity benefit, maternity homes, and the recent increasing concern for expectant and nursing mothers have played their part in producing this result. The boroughs which show the greatest relative improvement in infant mortality since 1911–14 are Greenwich, Battersea, and Poplar, while St. Pancras and Kensington have lost place.

The small outbreaks of *small-pox* have been of a severe type, in contrast with the mild type prevalent lately in the North and Midlands. In all 65 cases were notified in London, of which 20 ended fatally, a case mortality of 30·8 per cent. Of 5 cases, showing no signs of vaccination and in which vaccination was doubtful, 3 died, 2 recovered; of 14 unvaccinated 7 died, 7 recovered; of 46 vaccinated in infancy 10 died, 36 recovered. The three shortest intervals between primary vaccination and the attack were 14, 16, and 16 years respectively; the three shortest intervals between primary vaccination and a fatal attack were 43, 44, and 49 years respectively. In 1901 the weak spot in the defence of London was the difficulty in identifying many cases of the disease. Thanks to the research work of the late Dr. T. F. Ricketts that defect has now been remedied, and the services of Dr. W. McC. Wanklyn, who has carried on the traditions of Dr. Ricketts, have been placed at the immediate disposal of the medical profession of London whenever a suspected case arises.

Sir William Hamer deals again with the influence of the movement of the population on the *phthisis death-rate* in London, and quotes Dr. M. Greenwood on the question of bringing "unsalted" (rural) populations into contact with urban civilisation, and the conclusion of the latter that "adolescent migration perhaps increases mortality in both populations—rural mortality by the withdrawal of those best fitted to survive under the rural environment, urban mortality by the introduction of those ill-adapted to survive under urban conditions." The apparent arrest of the downward trend of the phthisis death-rate in London (in 1922 it was 1·08) which occurred about 1911 is associated with decrease in the emigration of phthisical persons and with the transfer to London of deaths of London residents taking place elsewhere.

The report deals at length with the decline of *typhoid fever* during the last 20 years and the disappearance of the autumnal rise, and gives an interesting diagram showing the incidence of typhoid fever in four-weekly periods on the boroughs of London since 1891. The main burden fell in the past upon people living in certain poor areas from the thirty-seventh to the forty-eighth week of the year. The problem in London has now been narrowed down to examination of the parts played by fish and shell-fish respectively. After analysis of the notification figures, Sir William Hamer concludes that there is little evidence of infection by cockles and mussels, and that "the London evidence, at any rate since 1891, incriminates mainly flat fish, generally plaice, almost always purchased as cooked (fried) fish, and often in an ungutted state." The first-hand evidence of hundreds of patients has been taken. The incriminated fish are immature plaice from 4 to 10 in. long which used to be brought to London from fishing-grounds near the mouth of the Elbe. In 1906 the London County Council raised the question with the City Corporation as to the need for the inspection of these small fish at Billingsgate, and since 1907 the fishing-grounds in question have been gradually abandoned by English trawlers. The decline of typhoid fever in London has tallied very closely with the disuse of these grounds as a source of London food-supply.

With regard to *venereal diseases*, Sir William Hamer comments with satisfaction on the decline in new cases of syphilis and the fact that the new cases of gonorrhœa are gradually approximating to the relative figures of 1 of syphilis to 3 of gonorrhœa, hitherto held to be the ratio of cases in the community. Other satisfactory features of the scheme are that the ratio of attendances to new cases goes up year by year and that the medical practitioners make increased use of the pathological facilities provided. There are 28 centres in London, and it is interesting to observe that 19·1 per cent. of the new cases attend the model clinic at St. Thomas's Hospital, and further that 28·3 per cent. of the attendances and 25·4 per cent. of the pathological examinations are made at this clinic. Sir William Hamer thinks that the failure to complete treatment is not so serious as generally supposed, and that the strictness of the definition of cure has given rise to erroneous impressions. He further states that there are good grounds for believing that the work done at the V.D. clinics in London will compare very favourably with that obtaining in those colonies where the system of compulsory notification and attendance is in operation.

The census of 1921 showed that the general distribution of the available *housing accommodation* was better than in 1911. "It is a very striking fact that in the majority of boroughs there has been a distinct improvement in respect of overcrowding conditions, especially in the central and eastern districts, which are largely occupied by the poorer classes."

Sir William Hamer gives a summary of a further investigation carried out by Dr. F. C. Shrubsall and Dr. A. C. Williams into the relationship between delinquency and *mental deficiency*. Full use is not made of the accommodation at St. Margaret's Hospital for ophthalmia neonatorum, and the Departmental Committee on Blindness think it would be preferable to secure the use of a few beds for this disease at several of the well-known teaching hospitals.

The *school report* shows that 199,812 children were inspected belonging to the three age-groups of entrants, 8-year-olds, and 12-year-olds. Of these a smaller percentage needed treatment than ever before, the percentage figure being 37·9. The figure for 1921 and 1920 was over 39, for 1919 over 42, and for 1918 44. Malnutrition was greatly reduced during the artificial prosperity of the war. In 1920 there was a set-back and remedial measures, such as school feeding and unemployment allowances, came into play, allied with children's care organisations, and now it is satisfactory to learn that the number of children actually suffering from under-nourishment is lower than when war prosperity was at its height. The wonderful progress made in cleanliness is excellent news, as also the astonishing improvement in dental conditions. Children are now leaving school who came under dental inspection at the ages 6 to 8. Unhealthy conditions of the throat and nose, though still rife, show year by year a diminishing incidence, and "there is good ground for the belief that greater attention to hygiene is really diminishing the prevalence of nasal disease." There is a diminishing number of children referred for tonsils and adenoids, and this gives an opportunity for the introduction of more adequate methods than formerly. The heavier incidence of visual defects upon

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[1] The Lancet, July 28th, p. 183. [2] Ibid., p. 198.

Eastbourne.

The total number of children examined during the year was 1285, 28 of these being special cases. In 48 per cent. of the cases the parents attended. Malnutrition cases were less than half the number recorded last year owing to an improvement in economic conditions in Eastbourne. Uncleanliness and skin diseases have decreased, but no fewer than 50 per cent of the children examined had defects recorded. Clinics are held daily at the Town Hall, and operations are performed at the hospital. Altogether 3083 children attended the various clinics, making 6544 attendances. Dr. W. G. Willoughby reports that the open-air school opened in June, 1920, has fully justified its existence. At the end of the year there were 60 children, boys and girls, on the books. The majority of cases are suffering from anæmia and malnutrition, free meals being given where necessary, also hot milk in the mornings. The cost to the education authority of this school for one year was just over £28, apart from salaries.

MENTAL HOSPITALS SERVICE.

ROYAL EASTERN COUNTIES INSTITUTION FOR THE MENTALLY DEFECTIVE, COLCHESTER.

The sixty-fourth annual report of this institution is an attractive publication, one of its purposes being to gain new subscribers to the institution. The illustrations give a happy impression of its activities. Influential support has been given to this institution throughout the Eastern Counties; a large sum is added annually to the funds by means of collections in various towns and districts undertaken by an organisation under the direction of the Duchess of Grafton. Of the children, who form the main body of the inmates, a great number are cared for at rates which bear no relation to the cost of maintenance, and the expenses of the institution, as well as its further expansion, are therefore largely dependent on subscriptions.

The numbers accommodated have increased greatly during the last few years, and a sixth branch home has recently been opened. An excellent site is available for a rebuilding scheme, which would not only provide additional and better accommodation, but simplify the management and reduce the cost of upkeep at present involved in maintaining six separate branches scattered over a wide area. The output of the workshops, which afford occupation for many of the inmates, shows a notable increase, and domestic or outdoor work of some nature, however simple, is assigned to everyone capable of performing it, much to the benefit even of the lower grades, who may previously have felt that they were "no good to anyone." Games of all kinds—swimming, music, and acting and other entertainments—appear to take a large part in the life of the institution. A small proportion of the higher-grade cases leave the institution to take up work elsewhere, principally domestic service, and this system has been successful, but its extension to factory work is at present impossible owing to the prevalence of unemployment among normal persons.

There has been an increase in the number of epileptics admitted. The medical superintendent, Dr. F. D. Turner, does not regard their segregation from other patients as either practicable or really necessary. The results in these cases, which at present form 13 per cent. of the total population, are disappointing. Dr. Turner says of them: "Although we continue to test new remedies which are frequently brought out, I am unable to report any good results." The institution has been singularly free from infectious disease, and the deaths that have occurred have been principally among patients of the lowest grade, in whom the duration of life, owing to coincident physical feebleness, rarely exceeds 25 years.

Correspondence.

"Audi alteram partem."

THE TOOTH-BRUSH AS A CARRIER OF VIRULENT DIPHTHERIA BACILLI.

To the Editor of THE LANCET.

SIR,—Mr. A. T. Pitts, in his letter to THE LANCET of June 16th (p. 1238) on "The Rôle of the Tooth-Brush," drew attention to the risks attaching to the tooth-brush as a harbourer, and therefore potential spreader, of infection. In support of his statements, and directly bearing on these risks, the following note is perhaps worthy of record.

The occurrence of several cases of diphtheria at an industrial school in the Midlands led to an investigation by one of us (G. H. C.), with the object of discovering possible factors concerned in spreading the disease amongst the boys. A certain boy (E.) had previously been found with nasal excoriation which yielded, on swabbing and cultivation, abundant *B. diphtheriæ*, and he had, in consequence, been transferred to hospital. The tooth-brush used by this boy came under suspicion as a not unlikely vehicle of infection, and, to satisfy curiosity on this point, was submitted to J. G. F. for bacteriological examination.

It should be stated that the brushes belonging to the boys were each clearly marked with the owner's number, and when not required were hung separately by means of rings from a shelf in the school lavatory. "Carbolic" tooth-powder was in general use, and was supplied to the boys from a common bowl. It was stated by the superintendent of the school that, following E.'s removal to hospital, he had as a precautionary measure soaked E.'s tooth-brush (and also the brushes of other boys) for 36 hours in a 5 per cent. solution of a disinfectant of the lysol class. During the period of about ten days, which elapsed between this soaking and its removal on May 23rd for bacteriological examination, the brush in question had been hanging in its usual place in the school lavatory.

Bacteriological Examination.—The brush was received a fortnight after being last in use by E. The lower half of the bristles and their insertion into the bone holder were coated with the remains of pink tooth-powder. About a score of bristles were detached and cultivated on the surface of plated blood-serum. After 24–48 hours' incubation it was possible to select from the mixed growth investing the various bristles a certain number of the most likely looking colonies. These were pricked off and transferred to sloped serum tubes and incubated at 37° C. The sub-cultures resulting consisted of various cocci and bacilli, and included in the latter group were certain diphtheroids and what appeared to be morphological *B. diphtheriæ*. On further sub-culture the latter were definitely isolated and identified microscopically, and were also found to ferment glucose, but not saccharose. Confirmatory evidence as to the true character of the isolated organism could only be supplied by animal test. For this very necessary means of proof we are much indebted to the kindness of Drs. W. M. Scott and A. J. Eagleton, to whom separate sub-cultures were sent. Their independent results by animal-inoculation tests showed the organism to be indisputable virulent *B. diphtheriæ*.

There is, therefore, no doubt that a tooth-brush may, as Mr. Pitts stated, "harbour infection," and, although not proven in the instance here recorded, it is highly conceivable that by mixed brush contact, or if "used promiscuously" by others than its owner, the tooth-brush may lead to the dissemination of infection from an active diphtheria "carrier." The use by the boys in common of the tooth-powder bowl suggests a further possible means of spread. It would also appear that the practical disinfection of tooth-brushes, whether by the particular powder in favour or by immersion in reputed "disinfectant" girls compared with boys tends to grow less, and the medical service is consistently endeavouring to lessen the bad effects of fine work. Dr. G. Chaikin has conducted an inquiry with regard to chorea and finds a tendency for cases of chorea to follow inversely the rise and fall of the barometric pressure, but has not traced a relationship between relative humidity and the incidence of chorea. The insidious onset of rheumatism is the difficulty, and stress is laid upon the necessity for attention to unhealthy throat conditions.

Dr. C. N. Atlee has investigated the *prevalence of goitre.* Of 77 goitrous children, 21 had apparently normal health, while of the remaining 56, 10 were mentally defective, 4 were congenitally deaf, 1 had congenital heart disease, 1 congenital cataract, and 3 were epileptic. Dr. Atlee is of opinion that goitre has increased latterly. Dr. A. G. Wells reports favourable results from *ionisation for ear disease.* Of 155 children treated, 108 were put right by one ionisation.

The Board of Education have made certain suggestions for the improvement of the *treatment scheme*, and important modifications have been made in the agreements between the Council and committees of treatment centres with a view to obtaining the highest available standard of work at the centres.

SCHOOL MEDICAL SERVICE.

Blackburn.

The total number of children examined was 7487, and of these 6067 came under the code groups. Forty cases of malnutrition are recorded at routine inspection and Dr. Allen Daley refers to malnutrition as the one defect where statistics of different places are not comparable owing to the personal factor influencing the examiner's judgment as to what is malnutrition and what is not. We would refer Dr. Daley to the work of the nutrition clinics in America, where a standard ratio of heights and weights is taken for different ages, and any variation above or below this is classified. In this way a standardised conception of nutrition and malnutrition is obtained, eliminating as far as possible the personal factor.

Dr. Daley, in common with the school medical officer for Cardiff, draws attention to the large number of children not physically fit at 5 years of age, and this is true for all the country. Maternity and child welfare departments are normally responsible for safeguarding the health of children up to the age of 5 years, or previous to their admission into school. It is impossible to exercise more than a casual supervision over children more than 2 years of age, and further, mothers are usually reluctant to take older children to a clinic, which they regard as primarily for babies. It appears that the next forward step in public health administration must be concentrated on this "No Man's Land" between 2 and 5 years. School clinics are open to these children very often, but they do not by any means adequately supply the crying need of careful examination, training, and observation of these little ones, and to bridge the gap between 2 and 5 in a place like Blackburn, a nursery school is evidently called for. Forty-six children were treated for speech defects. Two revision courses of three weeks were also taken; a brief summary of the results is given:—

Speak well and clearly—no stammer ..	34
Speak with occasional hesitation	4
Improved	6
No better	2

Dr. J. Robertson investigated the alleged association between left-handedness and stammering, and it was demonstrated that there was no special connexion between them.

Carlisle.

Of the 2483 children inspected in the routine age groups, nearly 25 per cent. were referred for medical treatment, and 42 per cent. were kept under observation for defects. Of the number referred for treatment 96 per cent. received it. Malnutrition cases amounted to 379, or 15 per cent., as compared with 9 per cent. the previous year; 18 per cent. were suffering from defective vision, 2 per cent. from defective hearing; tuberculosis definite and suspected 4 per cent. The decrease in the number of cases suffering from scabies and ringworm is considerable, scabies accounting for 516 cases as compared with 2360, and ringworm 476 as compared with 3384. Dr. Joseph Beard has calculated that the eradication of scabies and ringworm has increased school efficiency since 1919 to the extent of an additional daily attendance of 77 children, or 1 per cent. on the average daily attendance. One hundred and four school-children attended the tuberculosis dispensary during the year, 15 being new and 89 old cases. The school dentist's report shows 91 per cent. of the permanent teeth examined sound, 6·2 per cent. saveable, and 1·9 per cent. unsaveable, against 88 per cent., 9 per cent., and 2·9 per cent. respectively for the previous year. He regards the production of the largest percentage possible of sound permanent teeth as the main object of school dental work. He finds that the bad septic mouth is now the exception rather than the rule, and that the children's teeth are on the whole cleaner and their mouths healthier.

Cardiff.

The total number of medical examinations for 1922 was 9911 in the routine groups and 2563 special cases. Skin disease was recorded in 7·2 per cent., defective vision in 6·6, and otitis media in 2 per cent. On the whole the proportion of children showing defects of one kind or another is remarkably constant, such slight increases as have occurred being mainly due to the increased number of special cases examined. Malnutrition was found in 0·9 per cent., these figures being the same as for 1920. Dr. Ralph M. F. Picken has set out the tables of heights and weights for 1914, 1921, and 1922, to demonstrate the absence of any notable change since the beginning of the war.

The number of children found or suspected to be suffering from tuberculosis was 76. These children were all attending school at the date of examination. During the year 17 children between 5 and 15 years of age died of tuberculosis. Remaining at the end of the year were 35 children known to be suffering from or suspected of tuberculosis and excluded from school for this reason, while other 14 children of school age had never attended because of tuberculosis. Altogether the total number of cases of tuberculosis between 5 and 15 years of age whose names remained on the records at the end of the year amounted to 123, and Dr. Picken goes on to say that none of these ought to be in attendance at the ordinary school but many would be suitable for education in a special school. Out of 4087 children commencing school life, 32·3 per cent. were found to require either medical treatment or observation. The existence of such a percentage of disease or ill-health in pre-school years definitely points to the necessity for establishing a nursery school in Cardiff to follow on the child welfare centres. Of the 2775 children requiring treatment during the year, the necessary treatment was carried out in 61·3 per cent. of the cases.

Three cases of accidentally acquired syphilis are recorded, all of which cleared up rapidly after a course of novarsenobenzol injections and hydrarg. cum cret. at the V.D. clinic. The superficial resemblance which the cases bore to ringworm, impetigo, and psoriasis diverted the attention from the possibility of secondary syphilis, and it was only after a more complete examination that the true nature of the disease was established.

Leamington Spa.

The number of children examined in the three code groups was 1102, an increase of 316 over last year. Apart from uncleanliness and dental defect, 13 per cent. were found to require medical treatment. This was carried out at the hospital in 301 cases out of the 392 requiring it. Sixty per cent. of the children in attendance at school were found to be unvaccinated, and Dr. W. L. Goldie puts this state of affairs down of the mouth may have similar powers, not only of resistance to "disinfectant" action, but, as has recently been shown by experiments, with bacteria of the soil at Rothamsted,[2] of actual growth by splitting up the antiseptic and so causing its disappearance.

We are, Sir, yours faithfully,
G. H. CULVERWELL, M.D., D.P.H. Dub.
J. GRAHAM FORBES, M.D. Camb., F.R.C.P., D.P.H.
London, July 31st, 1922.

ROYAL MEDICAL BENEVOLENT FUND.

To the Editor of THE LANCET.

SIR,—It is reported that Dr. G. E. Haslip, treasurer to the British Medical Association, speaking at the recent annual meeting of the lack of support of the Royal Medical Benevolent Fund, stated that "the funds are conducted in much the same way as they were 30 years ago; no new ideas are ever introduced, and there is absolutely no progress."

This may be correct with respect to the administration of the Fund, probably necessarily so having regard to the limited sums at the disposal of the Committee, but I venture to think that a new idea of a progressive nature was introduced when the medical practitioners on the panel in Leicester consented unanimously to subscribe annually towards medical and allied charities a farthing for each State-insured person on their lists. This yields over £100 per annum, and £50 have been given to the Royal Medical Benevolent Fund for each of the last two years, and in all probability a similar sum will be sent this year. The remainder of the amount raised is distributed locally to medical and allied charities.

I would suggest that steps be taken to urge every State insurance area in the country to follow this example. If this were effected, the "disgrace to the profession" would be quickly removed as the sum accruing on, say, 10 million insured persons, would be upwards of £10,400 per annum. This would enable the Committee to deal with a more generous hand, and the stigma of "miserable doles" would be a thing of the past. I am, Sir, yours faithfully,

ASTLEY V. CLARKE,
Treasurer, Leicester Sub-Division of Union of Medical Practitioners.
Leicester, July 27th, 1923.

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

To the Editor of THE LANCET.

SIR,—If ophthalmology is to be made a subject for the qualifying examination, in my opinion it would be advisable for ophthalmologists to set out what they regard as essential for the medical student to know. For clearly ophthalmology as a whole must be a post-graduate study. With the idea of arriving at some definite conclusion on this point, I suggested to the Council of the Ophthalmological Section of the Royal Society of Medicine a year or two ago that I should open a discussion on the teaching of ophthalmology to medical students.

To take one point, which might be usefully discussed—namely, the use of the ophthalmoscope—it is quite possible for the student to learn how to handle the instrument, and to see the disc, and perhaps draw what he sees. But it is impossible with the short time at his disposal to acquire any useful knowledge by means of the instrument, in the sense of being able to recognise early papillitis, slight optic atrophy, or retinitis. And apart from the ability to do that, I much doubt if the ophthalmoscope be of any use in general practice.

I have always grudged the relatively large proportion of time spent by students in the dark room. On the one hand they were not learning anything practically useful, and on the other hand they were missing opportunities of examining cases of external diseases, conjunctivitis, iritis, and the like, cases which are of frequent occurrence in general practice, and the recognition of which is so important. And the same criticism applies, I think, to time spent in learning to estimate—as distinct from learning to recognise—errors of refraction.

I am, Sir, yours faithfully,
Harley-street, W., July 31st, 1923. PERCY FLEMMING.

THE TREATMENT OF HABITUAL CONSTIPATION.

To the Editor of THE LANCET.

SIR,—I was greatly interested in Dr. A. F. Hurst's article on the Treatment of Habitual Constipation.

I have seen some of the most serious cases of habitual constipation *cured* by the persistent use of the liquid extract of cascara, but as a rule it takes 6 to 12 months to effect a cure. At first 20 to 30 drops ought to be taken three times a day in water after meals. After a few weeks the dose can be very gradually lessened, until at the end of five or six months it is reduced to three or four drops, or even to one drop three times a day. This treatment teaches the bowels to get into the daily habit of evacuation. The difficulty is to get patients to persevere over so long a period until a cure is effected.

Habitual constipation has been treated "by suggestion." The method is certainly worth trying in some of the most serious cases. I may note a remarkable case which came under my notice. The patient, an American lady, consulted a well-known authority on hypnotism, who, after a short consultation, told her that her case was very simple, and that she would have a daily evacuation of the bowel every morning at 10 o'clock. Some time after she appeared again with the report that she was perfectly cured, but requested that the physician would make the time 9 o'clock as the earlier hour would be more convenient.

I am, Sir, yours faithfully,
SAMUEL R. COLLIER, M.D.
Wimbledon, July 24th, 1923.

THE MEDICAL DIRECTORY, 1924.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to every member of the medical profession and most of the returns have already been received. If any practitioner has not yet sent us the latest information, we shall be glad to receive it by an early post.

We are, Sir, yours faithfully,
THE EDITORS.
7, Great Marlborough-street, London, W. 1,
July 30th, 1923.

LIVERPOOL ROYAL INFIRMARY: NEW NURSES' HOME.—The Duke and Duchess of York paid a visit to the city on July 24th, principally for the purpose of laying the corner stone of the new building. The first portion is estimated to cost between £40,000 and £50,000, of which all but about £5000 have already been collected. The proceedings included the presentation of a Carnegie Hero Trust bronze medallion to Mr. C. R. Woods, who has been X ray operator to the infirmary since 1903, and who is now incapacitated by X ray dermatitis from further service.

PEOPLE'S LEAGUE OF HEALTH.—The travelling scholarship prize award in connexion with the Sims Woodhead series of Constructive Educational Health Lectures recently given by the League at the headquarters of the National Union of Teachers, Mabledon-place, London, W.C., has been made to Miss Alice Gloyn. Miss Gloyn, who since 1917 has been in charge of the Camberwell Day Sanatorium, working under the London County Council in conjunction with the tuberculosis officer for Camberwell, has chosen to attend Dr. A. Rollier's course of lectures on heliotherapy at Leysin in Switzerland, from August 13th to 19th. Miss Gloyn will also visit the Grancher and other institutions in France dealing with tuberculosis in children.

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[2] The Bacteria of the Soil and the Utilisation of Organic Antiseptics. By P. H. H. Gray, M.A. (Rothamsted). "Discovery," June, 1923, p. 153.

solution, may be by no means as reliable or effective as is commonly believed.

Lysol Disinfection of Artificially Infected Tooth-Brushes.—To test this point under conditions as nearly approaching the real as possible, three used tooth-brushes were dipped in 5 c.cm. peptone emulsion of a 24 hours' serum slope culture of the *B. diphtheriæ* derived from E.'s brush. The brushes were then allowed to dry in the incubator in covered Petri dishes and were afterwards soaked in solutions of the same brand of lysol as that used at the school, which in 2 per cent. strength purports to kill *B. diphtheriæ* in one minute. The strengths of the lysol used for the tests were 1, 2, and 5 per cent. dilutions, in each of which the separate brushes remained for periods of 1, 5, 15, and 30 minutes, and finally 24 hours.

At the conclusion of each of the periods, and after a brief rinsing in sterile water to remove excess of lysol, bristles were extracted with every possible precaution against contamination, allowed to dry for a few minutes in sterile Petri dishes, and then transferred to the surface of plated serum for 24 hours' incubation at 37° C. Previous to the lysol immersion a few bristles were removed from each artificially infected brush for control cultivation.

The final results of a series of repeated tests were as follows: 1. *B. diphtheriæ* were isolated from each of the three controls, which were also heavily but not equally infected with various cocci, sarcinæ, and unidentified bacilli. 2. Using freshly prepared lysol solutions, *B. diphtheriæ* were successfully isolated in two series of tests from bristles of brushes which had been exposed for 1 and 5 minutes to a 2 per cent. solution, and for 1 minute to a 5 per cent. solution of lysol. A suspicious bacillus was also isolated from 5 per cent. lysol after 5 minutes' exposure, but proved to be a diphtheroid, resembling *B. xerosis.* 3. Using lysol solutions, which had been standing for at least two days, *B. diphtheriæ* were obtained from bristles after exposure to a 5 per cent. solution for as long as 15 minutes.

A culture of the *B. diphtheriæ* which had been isolated from bristles exposed to 2 per cent. lysol for 5 minutes was submitted to Dr. Scott, who again very kindly applied a guinea-pig test, and has reported the strain to be "still virulent." We are also much indebted to Dr. C. C. Okell, who found the diphtheroid, already mentioned, to be avirulent; but the *B. diphtheriæ, surviving 5 per cent. stale lysol for* 15 minutes, was virulent. Such results were to be expected, as the parent culture from E.'s tooth-brush had also proved virulent, and no change in virulence was likely to occur as the result of the surviving organism's exposure to the disinfectant.

Whilst accepting with some reserve the accuracy of the 5 per cent. strength of the lysol solution, in which E.'s tooth-brush was reported to have been soaked for 36 hours, it is not improbable that the diphtheria bacilli were in some measure protected from the action of the lysol by accumulations of oral mucus and tooth-powder adherent to the bed of the brush.

Under the conditions of the imposed tests with the various lysol solutions, no such protection was afforded to the organism on the artificially infected bristles and presumably the bacillus would be more readily killed, although it proved capable of withstanding the action of a 5 per cent. lysol solution for at least 15 minutes. Mention should be made of the omission to note a point of some importance which was overlooked in the quite unexpected discovery of *B. diphtheriæ*—namely, whether the original diphtheria colonies from E.'s brush were derived from the embedded, and therefore protected, root or from the free end of the bristles.

Subsequent attempts at some weeks' interval were made to obtain this information by planting a further series of bristles from E.'s brush on to plated serum; but the results proved inconclusive, in that the chance successful finding of *B. diphtheriæ* was not repeated; however, the embedded loops of the bristles clearly showed, from the more abundant growth, that they were more heavily contaminated than the free ends.

In view of Mr. T. H. Marshall's letter in THE LANCET, also of June 16th, urging the need of "A Standard for Lysol," it was obviously important to know the composition of the particular brand of lysol used in the above tests. For this information we are much indebted to Mr. E. T. Shelbourn, F.I.C., whose analysis was as follows: Water, 12·5 per cent.; phenolic bodies distilling between 196° and 208° C., 46·2 per cent.; soap, &c., 41·3 per cent.—i.e., very similar to the original lysol, containing approximately 50 per cent. cresylic acid.

The tests undertaken with lysol in the three dilutions are not claimed to be sufficiently comprehensive as to yield a conclusive index of this disinfectant's bactericidal power. They were applied primarily to ascertain what dilution and length of exposure were necessary to inhibit or destroy *B. diphtheriæ* on artificially infected tooth-brushes. Under such artificial conditions it would appear that immersion for one minute in a 5 per cent. solution, or for five minutes in a 2 per cent. freshly prepared solution of standard lysol is insufficient to kill the organism.

From the diminished bactericidal power of lysol shown by results in the third series of tests, the importance of the solutions being freshly prepared appears evident. The tooth-brushes employed differed considerably as regards their original state of bacterial pollution and their mode of construction, which allowed of retention of impurity to a varying degree. For these reasons it proved difficult to assess the strength and duration of lysol treatment required for sterilising any individual brush. Whereas, for one less heavily infected, immersion for half an hour in 2 per cent. solution sufficed to sterilise the majority of bristles; in the case of another brush, after 24 hours in a 1 per cent. solution, the growth of cocci and spore-forming bacilli still obtained, was sufficient to mask the isolation of *B. diphtheriæ;* whilst bristles from a third brush required half an hour's exposure to a 5 per cent. solution before effectual sterilisation was reached. In the case of solutions not freshly prepared, 24 hours' exposure in 2 per cent. solution was insufficient to sterilise, but 5 per cent. solution for half an hour was effective for the majority of bristles.

If, as stated, E.'s tooth-brush was soaked in 5 per cent. lysol for 36 hours, the strain of *B. diphtheriæ* surviving was either unusually resistant, or more probably was so protected in the deeper part of the brush as to be beyond the reach of the disinfectant. Such a brush infected by a diphtheria carrier may well require longer than half an hour in 5 per cent. solution lysol for its disinfection, and the safest course is obviously to destroy it. The fact that the tooth-brush is but one of many likely vehicles of infection from a diphtheria carrier opens up a wide field for survey—particularly in residential schools—in dealing with an outbreak of diphtheria.

Among the articles to be considered are pencils and penholders,[1] spoons and forks, common drinking cups at playground fountains, school call whistles, the mouthpieces of bugles or band instruments, and—amongst boys—the cigarette not uncommonly passed from mouth to mouth. Surgeon-Commander S. F. Dudley,[1] in drawing attention to the penholder as a possible source of spread of diphtheria infection, states: "Nearly all children bite the ends of their pens, and, as this is so, a penholder must be looked on as an even more personal article than a tooth-brush. The latter is in the mouth for shorter periods than the pen, and in addition is generally soaked with a solution of some antiseptic dentrifice."

The case here recorded, however, shows that the risk of infection attaching to the tooth-brush, despite implied antiseptic protection, may be no less than that of the penholder.

The survival of organisms on tooth-brushes exposed to lysol offers a tempting analogy to the behaviour of soil bacteria in the presence of phenol, cresylic acid, and naphthalene, suggesting that some of the varied flora

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[1] Medical Research Council, Special Report Series, No. 75, pp. 46 and 47. A Study in Epidemiology, by S. F. Dudley.

Florence M. Pearson, Royal Free and St. Mary's; Gerard G. Penman, Cambridge and St. Thomas's; Richard P. Perera, Ceylon and London; Alan C. T. Perkins, King's Coll.; Leslie P. Phillips, Charing Cross; Jeffrey W. Poole, St. Bart.'s; Thomas H. I. Potts, Sheffield and St. Mary's; Abraham T. W. Powell, Guy's; Chernagiri Krishnaswami Rau, Madras and Middlesex; Leslie Reuvid, Univ. Coll.; Esther M. E. E. Rickard, Royal Free; Ronald Riley, Cambridge and St. Mary's; John Roberts, Liverpool; Morris Robinson, Univ. Coll.; Thomas E. Ryves, Oxford and St. Bart.'s; Lewis H. Savin, King's Coll.; James M. Schofield, St. Mary's; Harry Seelenfreund, Guy's; Wilfrid P. H. Sheldon, King's Coll.; Ronald W. Smith and Arthur J. Smyth, Cambridge and St. George's; Francis A. R. Stammers, Birmingham; Doris M. Stone, Royal Free; Robert V. Storer, Adelaide and St. Bart.'s; George R. M. Swan, St. Thomas's; Ronald G. Tame and Harry C. C. Taylor, Guy's; Hugh A. Thomas, Liverpool; Thomas B. Thomas, St. Bart.'s; Guy L. Thompson, Cambridge and London; John H. Thompson, Univ. Coll.; George K. Thornton, Cambridge and St. George's; Percy Thwaites, St. Bart.'s; Doris Todd, Royal Free and St. Mary's; Norman C. Tughan, Univ. Coll.; Frank S. Vaughan, Birmingham and London; Arnold L. Walker, Cambridge and Middlesex; Edward G. L. Walker, St. Thomas's; Hygeia L. J. Wallace, Royal Free and Charing Cross; M. H. Webb-Peploe, Cambridge and St. Thomas's; Ethel Whitby, King's Coll.; Norman L. White, Cambridge and Univ. Coll.; Joan F. Whitelock, Univ. Coll.; Alan K. Wiggins, Middlesex; Ernest G. Wilkinson, Birmingham; Hubert C. M. Williams, St. Bart.'s; Ronald E. Wilson, Cambridge and London; Robert K. Wilson, London; Ioos E. Wolf, Zurich; Edith V. Wood, London; Eric Wornum, Guy's; James T. Wybourn, St. Mary's; Harry D. Wyse, Guy's; Mildred M. E. Yate, Royal Free; Bhaskar Balvantrao Yodh, Bombay and London; Joyce P. Yeoman, Royal Free and St. Mary's; Bishai Zeitoun, Assiut and King's Coll.; and Louis S. V. Zinober, Cape and London.

Diplomas in Tropical Medicine and Hygiene were conferred upon the following 16 candidates:—

Justin W. F. Albuquerque, Alec H. Baldwin, John Donald, Ganesh Venkatrao Gollerkeri, Arthur J. Keevill, Allan N. Kingsbury, Frank McCallum, Colin McIver, Emilio J. Pampana, Edwin Peterson, William J. E. Phillips, John L. Rebello, Anis Salama, Narinjan Singh Sethi, William H. Simmons, and Douglas J. Valentine.

Diplomas in Ophthalmic Medicine and Surgery were conferred upon the following 11 candidates:—

Monty Baranov, Thomas Butler, Richard Colley, Thomas Colley, Mahmoud A. M. El-Kattan, James G. F. Heal, Philip C. Livingstone, Brenda A. Mitchell, Zelman Schwartz, Sundar Das Sondhi, and Nand Lal Varma.

Diplomas in Public Health were conferred upon the following 19 candidates:—

Phanindra Nath Basu, William T. G. Boul, Lancelot G. Bourdillon, Frank A. J. Brodziak, Maude C. Cairney, Alan W. Carleton, Alan A. Cockayne, Katherine M. L. Gamgee, Edward Hesterlow, Neville H. Linzee, Muriel J. Lough, Donald W. McKay, Joseph L. Pawan, Sigrid L. S. Pearson, George L. Ranking, Harnath Singh, Gerald M. J. Slot, John Sullivan, and Mukund Lal Talwar.

Diplomas in Psychological Medicine were conferred upon the following 8 candidates:—

Yousif Abul-Nasr Barrada, Thomas M. Davie, Thomas L. Edwards, Mohamed Kamil El-Kholy, Frederick R. Martin, Eveleen B. G. Rivington, George W. Shore, and Peter M. Turnbull.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—E. F. Johnson, St. George's Hosp.; W. M. Jones, St. Bart.'s Hosp.; I. Lipman, Westminster Hosp.; W. R. H. Pooler, Cambridge and St. Mary's Hosp.; and A. J. Vickery, St. Mary's Hosp.

Medicine.—W. B. Arnold, St. George's Hosp.; C. M. John, Madras and Royal Free Hosp.; E. F. Johnson, St. George's Hosp.; I. Lipman, Westminster Hosp.; M. S. Mahmud (Section I.), St. Mary's Hosp.; and S. Thompson, Leeds.

Forensic Medicine.—W. E. Farnham, Birmingham; A. Gullertein, London Hosp.; E. F. Johnson, St. George's Hosp.; and H. Morris, St. Bart.'s Hosp.

Midwifery.—R. Caplan, Glasgow; J. B. Couche, Toronto University; W. E. Farnham, Birmingham; E. F. Johnson, St. George's Hosp.; J. Herbert, Guy's Hosp.; N. Howard, Liverpool; and R. C. Pratt, Birmingham.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: W. E. Farnham, A. Gullertein, N. Howard, C. M. John, E. F. Johnson, and I. Lipman.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on July 25th the following candidates, having passed the requisite examinations, were admitted Fellows:—

Tajammul Ahmed, Robert C. Begg, William E. R. Coad, Arthur Denham-White, Matthew J. Gibson, Chapple Gill-Carey, Harry M. Godfrey, Alfred W. Harley, Frank Harvey, Arthur T. Hawley, Nicholas E. Kendall, John S. Lloyd, Donald M. MacLeod, Gladys H. Marchant, Leon D. Mercer.

The following were admitted Licentiates:—

Dwijendra Nath Bhaduri and Hubert Collin van Dort.

The following candidates have passed the Final Dental Examination, and have been granted the diploma of L.D.S. R.C.S. Edin.:—

William Guild, Robert C. Cook, Jacobus M. Moll, Henry F. Skinner, Thomas T. Littlefair, William F. D. Grant, Robert W. Thackwray, James B. Cowie, Ian D. J. Smith, George M. Rose, Hector G. Robb, Alexander W. Seaton, David R. Paterson, Alexander Phillips, Walter Wyatt, Douglas M. Beaton, Thomas E. Mathias, John Ross, Francis G. Reid, and William A. Welsh.

The following passed in the subjects of pathology, medicine, and surgery:—

Stuart J. Beaton, John Dewar, George M. Brigg, Bernard S. Reynolds, Agnes M. E. Wilson, Kathleen M. Scott, Frank W. Walmsley, Alexander N. Wight, Robert Lauchlan, and Lourens W. Ackermann.

The following passed in the subjects of medicine and surgery:—

James Brydone, Lesslie Macduff, Charles E. Atkinson, and Nico H. Bartmann.

SMALL-POX IN ENGLAND AND WALES.—The epidemic has apparently reached its *fastigium*. During the week ending July 21st only 116 new cases of small-pox (with one death) were notified in England and Wales, as against 148 (with one death) in the previous week. The distribution of these 116 cases was as follows: Derbyshire 5 (Alfreton 1, Long Eaton 4); Gloucestershire 65 (Gloucester 57 "including 11 cases notified as chicken-pox but rediagnosed as small-pox," East Dean R.D. 6, Gloucester R.D. 1, Stroud R.D. 1); Lincoln 1 (Isle of Axholme R.D.); Notts 17 (Nottingham 1, Kirkby-in-Ashfield 4, Mansfield Woodhouse 4, Warsop 8); Somerset 1 (Langport R.D.); Wilts 4 (Swindon); Yorks North Riding 2 (Middlesbrough); Yorks West Riding 20 (Bentley-with-Arksey 9, Doncaster R.D. 11); Port of Plymouth 1.

THE VETERINARY PROFESSION AND PUBLIC HEALTH IN IRELAND.—Recently a deputation from the veterinary profession of the Free State interviewed the Minister for Agriculture and urged him to reorganise the public veterinary service of the country, with a view to safeguarding the health of the public and of live stock. The deputation suggested a thorough inspection of dairy cows, cattle marts, and abattoirs so as to prevent the transmission of communicative diseases and to secure a supply of sound animal products and the better control of contagious diseases of animals, particularly those transmissible to man. They urged strongly that there should be provision made for research into obscure diseases of animals, and drew attention to the importance, from the economic point of view, of being able to give Irish cattle a clean bill of health. The Minister, in reply, expressed his appreciation of the draft scheme submitted to him, and his willingness to do all he could to put it into effect. Our Irish correspondent adds: It is encouraging to see the veterinary and medical professions moving on parallel lines in the promotion of public health.

METROPOLITAN ASYLUMS BOARD.—A course of instruction in the diagnosis and treatment of fevers will be held twice weekly at each of the undermentioned hospitals from October to December: Eastern Hospital, Homerton-grove, Homerton, E. 9; North-Eastern Hospital, St. Ann's-road, Tottenham, N. 15; North-Western Hospital, Lawn-road, Hampstead, N.W. 3; Western Hospital, Seagrave-road, Fulham, S.W. 6; South-Western Hospital, Landor-road, Stockwell, S.W. 9; Grove Hospital, Tooting-grove, Tooting Graveney, S.W. 17; Park Hospital, Hither Green, Lewisham, S.E. 13. A two months' course will also be held in November and December at the South-Eastern Hospital, Avonley-road, Old Kent-road, S.E. 14. Students who desire to attend a course of instruction must, before attending at the hospital, bring between 11 A.M. and 4 P.M. on any week-day (except Saturday) or send by post to the Clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4: (1) Authority from the Dean of the Medical School. (2) Fee, £3 3*s.* for two months' course or £4 4*s.* for three months' course; cheques to be made payable to "The Metropolitan Asylums Board." (The student must definitely ascertain before taking out his course whether he requires a two or three months' course. In the event of his taking out a three months' course, the extra £1 1*s.* will not be refunded to him, if he finds subsequently that a two months' course only is required.) (3) Full name and address and name of medical school. (4) The names of at least two of the above hospitals, arranged in the order in which the student would prefer to attend, in case the classes at any of the hospitals should be already full. A course of lectures and demonstrations in hospital administration will be given from October to December at the North-Western Hospital. Fee for the course, £3 3*s.*; cheques should be made payable to the "Metropolitan Asylums Board." Medical men desiring to attend are required before attending at the hospital to pay the above mentioned fee to the clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4, giving full name and address.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary Comitia of the College was held on July 26th, Sir Humphry Rolleston being in the chair.

The following candidates, having passed the required examinations, were admitted as Members :—

Drs. F. Braid, R. A. Chambers, E. F. Creed, S. W. Davidson, S. C. Dyke, H. S. Le Marquand, G. R. McRobert, O. Marriott, W. Moodie, W. J. Morrish, E. O'Flynn, A. Patrick, G. M. J. Slot, G. H. Sowry, W. B. B. Taylor, G. D. Whyte, and W. B. Wood.

Licences to practise physics were granted to 193 candidates. Diplomas were granted, jointly with the Royal College of Surgeons, in Public Health to 19 candidates, in Tropical Medicine and Hygiene to 16 candidates, in Psychological Medicine to 8 candidates, and in Ophthalmic Medicine and Surgery to 11 candidates.

The following College Officers, Members of Committees, and Examiners for the ensuing year were elected on the nomination of the President, Council, and Library Committee :—

Censors.—Dr. John Fawcett, Dr. H. Morley Fletcher, Lord Dawson of Penn, and Dr. E. Farquhar Buzzard.
Emeritus Treasurer.—Sir Dyce Duckworth.
Treasurer.—Dr. Sidney P. Phillips.
Registrar.—Dr. Joseph A. Ormerod.
Harveian Librarian.—Dr. T. H. Arnold Chaplin.
Library Committee.—Dr. Herbert Spencer, Dr. W. Cecil Bosanquet, Dr. George F. Still, Dr. Charles J. Singer.
Curators of the Museum.—Dr. J. Mitchell Bruce, Sir Seymour John Sharkey, Sir Frederick W. Andrewes, Dr. William Hunter.
Finance Committee.—Dr. Arthur T. Davies, Dr. Raymond H. P. Crawfurd, Dr. Frederick J. Poynton.
Examiners.—Chemistry: Dr. William B. Tuck and Mr. Charles S. Gibson. Physics: Dr. Frederick Womack and Dr. William E. Curtis. Practical Pharmacy: Dr. Alfred E. Russell, Dr. Edward A. Cockayne, Dr. Philip Hamill, Dr. Alfred J. Clark, Dr. Walter E. Dixon. Physiology: Dr. John B. Leathes and Dr. John Mellanby. Anatomy: Dr. Thomas B. Johnston. Medical Anatomy and Principles and Practice of Medicine: Sir Archibald E. Garrod, Dr. John H. Drysdale, Dr. Arthur P. Beddard, Dr. William C. Bosanquet, Dr. James W. Russell, Dr. Charles R. Box, Sir James Purves-Stewart, Dr. Charles Bolton, Dr. Lewis Albert Smith, Sir William H. Willcox. Midwifery and Diseases Peculiar to Women: Dr. John P. Hedley, Sir Ewen John Maclean, Dr. Thomas G. Stevens, Dr. John D. Barris, Dr. Henry J. F. Simson.
Public Health.—Part I., Dr. Henry W. Hake; Part II., Dr. David Samuel Davies.
Tropical Medicine.—Sir Percy W. Bassett-Smith (Bacteriology); Sir Leonard Rogers (Diseases and Hygiene of the Tropics).
Ophthalmic Medicine and Surgery.—Dr. Gordon M. Holmes.
Psychological Medicine.—Part I., Dr. Henry Devine; Part II., Dr. James Taylor and Dr. Charles H. Bond.
Murchison Memorial Scholarship (1924).—Dr. Robert Hutchison and Dr. E. Farquhar Buzzard.

The following communications were received :—(1) From Sir Thomas Barlow, a former president, to the Emeritus Treasurer, Sir Dyce Duckworth, offering a gift of £1000 to the general funds of the Royal College, with a view to special assistance in the probable alterations to the College buildings. The offer was accepted and a most sincere vote of thanks was voted to Sir Thomas Barlow for his generous gift.—(2) From Dr. R. W. Innes Smith offering a portrait of Sir Charles Searburgh for the acceptance of the College. The Harveian Librarian, Dr. Arnold Chaplin, pointed out that this was one of the two known portraits of this celebrated physician. The offer was gratefully accepted and the thanks of the College were accorded to Dr. Innes Smith.—(3) An invitation to the centenary of the foundation of the Edinburgh Veterinary College was received and it was left to the President to nominate a representative.

The Baly Medal was awarded, on the nomination of the Council, to Mr. J. Barcroft, F.R.S.—The President announced his award of the Bisset Hawkins Medal to Dr. T. M. Legge.—The death of the Bedell, Mr. William Fleming, was reported to the College, and in connexion therewith the following resolutions were passed :—

1. That the College desires to place on record its deep regret at the death of Mr. William Fleming, and its high appreciation of his faithful and valuable services, which extended over 50 years, during 30 years of which he held the office of Bedell to the entire satisfaction of the Fellows and of all those with whom he was brought into contact.

2. That it be referred to a committee to report on all the regulations and questions connected with the duties, residence, and remuneration of the Bedell, and of any other official who may be required to carry on the administrative work of the College.

A committee was appointed to consider and report on the question of increasing the accommodation of the College, and on the best way of doing so, should it prove desirable.—An application from Dr. Philip H. Wells for the restoration of the membership resigned by him in January, 1922, was granted.—A report from the representative of the College on the General Medical Council concerning the last session of the Council, and a report from the representative of the College on the Managing Committee of the Chelsea Physic Garden were received and entered on the minutes of July 16th.—A report from the Committee of Management, dated May 9th and July 16th, was received and adopted.—After some formal College business, the President declared the Comitia closed.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of the Comitia of the Royal College of Physicians on July 26th, and of the Council of the Royal College of Surgeons on July 31st, diplomas of L.R.C.P. and M.R.C.S. were conferred upon the following 193 candidates (including 34 women) who have passed the requisite examination of the Conjoint Board and have complied with the by-laws :—

Patrick M. Acheson, King's Coll.; Noel F. Adeney, Cambridge and St. Mary's; Katharine M. Andrew, King's Coll.; William A. Atkins, Birmingham; George F. Axon, Charing Cross; Shriharsh Chintaman Bakhle, Guy's; William E. Barnie-Adshead, Birmingham; Alfred A. Battson, St. Thomas's; Arthur Beauchamp, Birmingham; Susanna M. Bernard, Royal Free; Douglas H. Berry, Guy's; John Bevan-Jones, Univ. Coll.; Thomas S. Blacklidge, Guy's; Nina O. Bohtlingk, Lausanne and Charing Cross; Edward R. Boland, Guy's; William B. Boone, Oxford and London; Jogesh Chandra Bose, Baltimore and Birmingham; John A. Brew, Middlesex; Enid A. Brock, Liverpool; Ralph Brooke, Guy's; Samuel N. Browne, Birmingham; William A. Caldwell, Guy's; Ralph H. Carter, McGill and London; Edward H. P. Cave, King's Coll.; Norman E. Chadwick, Cambridge and St. Bart.'s; John H. K. Clarke and Leslie T. Clarke, Birmingham; John E. Clegg, Manchester; Eric C. T. Clouston, London; Leon Collins, Leeds; George G. Cooke, Birmingham; Norman B. Cooke and Victor Cotton-Cornwall, Liverpool; Richard S. Creed, Oxford and St. Thomas's; Cecily D. Crosskey, Royal Free and Birmingham; John A. Currie and Gerald C. W. Curson, Guy's; William Dabbs, Birmingham; Cedric K. David, Univ. Coll.; Alfred B. Davies, Birmingham; Kenneth S. Dickinson, Durham; Michele A. Distaso, Bristol and Cardiff; Gerrit A. Dolman, Cambridge and King's Coll.; Helen M. Du Buisson, King's Coll.; Geoffrey Dudley, Birmingham; Alexander D. Dyson, Oxford and St. Thomas's; Francis Earlam, Liverpool; Harold C. Edwards, King's Coll.; Arthur J. C. Eland, St. Bart.'s; Harry N. K. Elphick; Oxford and King's Coll.; Robert H. Enoch, Cardiff and St. Bart.'s; Ursula E. Eva, St. Mary's; George M. Evans, St. Thomas's; Herman Evans, Cape and Guy's; John L. Faull, Guy's; Alec E. Fergusson, St. Thomas's; Mary D. Fletcher, Univ. Coll.; Kingsley Fletcher-Barrett, Cambridge and St. George's; Mary E. Fox, Royal Free and St. Mary's; Emily L. Franklin, King's Coll.; Noel G. C. Gane, Cape and Middlesex; Claudius E. Gautier-Smith, Cambridge and St. Thomas's; George F. Gibberd, Guy's; Albert D. Gladish, Univ. Coll.; Neville M. Goodman, Cambridge and London; Roy Goodman, Charing Cross; Arthur Gordon, Cape and Guy's; Brian W. B. Gordon, St. Mary's; William A. Gornall, Bristol; Arthur W. Gott, Leeds; Sydney A. Grant, London; Ernest H. Griffin, Cambridge and Guy's; Geoffrey E. R. Hamilton, King's Coll.; Alfred G. Hammond, Middlesex; Tatiana I. Hardy, Moscow and Royal Free; Albert J. Hawe, Liverpool; Montague Hawke, Guy's; Bernard D. Hendy, Cambridge and London; Gladys Hill, Royal Free; Nancy W. Holloway, Univ. Coll.; Max Honigsberger, Cape and Guy's; Mary D. Horton, Birmingham; Phyllis M. Horton, Royal Free and Manchester; Leslie G. Housden, Guy's; Edward R. Hughes, Liverpool and London; John T. Ingram, London; William O. C. Jarratt, St. Thomas's; Santo W. Jeger, London and St. Mary's; James Jemson, Guy's; Bertram H. Jones, St. Thomas's; Norman A. Jory, St. Bart.'s; Winifred A. Kane and Hilda M. Kennedy, Univ. Coll.; Maurice E. P. Killard-Leavey, Guy's; Geoffrey L. S. Kohnstam and Dushan Kostitch, King's Coll.; Emilia B. M. Krause, London; Kenneth H. Lachlan, Westminster; Ronald E. Lane, Guy's; Thomas Latham, Manchester; Harold V. R. T. Lauder, St. Bart.'s; Bernard J. Leggett, London; Meyer M. Lewin, St. Thomas's; John L. Lewthwaite, Liverpool; Carlos E. M. J. Libert, King's Coll.; Lewis O. Lindsay, London; Philip M. Lissack, Cape and St. Thomas's; William A. Lister, London; Basil S. Llewelyn, Cardiff and Westminster; James I. Lyons, Westminster; Cyril C. Mahoney, Madras and St. Mary's; Leslie P. Marshall, Cambridge and London; Charles A. Martin, London; Dorothy E. Mason, Royal Free and St. Mary's; Hugh R. Matthews, Cambridge and St. George's; Margarethe Mautner, St. Mary's; James Maxwell, St. Bart.'s; Margaret S. Mills, Royal Free; Elspeth B. Moffat, Cape and Royal Free; William B. R. Monteith, Cambridge and Univ. Coll.; John W. Morledge, Western Reserve; Alfred C. Mowle; Cambridge and St. Thomas's; John D. R. Murray, Cambridge and Middlesex; Louis Mushin, London; Albert Nathan and Maurice Newfield, Charing Cross; Edgar Obermer, Lausanne and St. Bart.'s; Herbert L. Oldershaw, St. Bart.'s; Carrie H. Osmond, Bristol; Chatbupuzhankaren Lonappen Ousep, Madras and Edinburgh; Emrys D. Owen, Cardiff; Julian N. J. Pacheco, Madras and London; Louise O. Paterson, Royal Free; Reginald T. Payne, St. Bart.'s; John Pearce, Westminster;

advisability of so amending the law as to prevent the continuance of a system that was inimical to the physical and mental welfare of these children.—Lieut.-Colonel LANE-FOX replied: I am aware that boys of 14 may legally be employed at night in coal-mines below ground provided that an interval of ordinarily 15 hours, and in no case less than 13 hours, separates two periods of work. I have received no representations that the law ought to be amended; I will certainly give them my most careful consideration if they are made to me.

Deputy Commissioners of Medical Services.

Mr. PIELOU asked the Minister of Pensions whether he was aware that instructions had been issued to ex-Service Deputy Commissioners of Medical Services terminating their temporary engagements at the end of September, and that non-Service doctors were being retained; and whether, in view of his expressed intention of giving preference in every case to the ex-Service claims, he would arrange that preference was given to ex-Service doctors in this connexion.—Captain CRAIG replied: It has been found necessary to give notice of termination of employment to 36 out of the 88 Deputy Commissioners of Medical Services employed on a six months' contract. Of those now under notice, 30 are ex-Service and six non-Service. There will then remain only four non-Service Deputy Commissioners employed on a six months' contract, and these medical officers are being retained in the interests of the pensioner in consequence of their special experience and qualifications.

Pensioners and Tuberculosis.

Mr. MCENTEE asked the Minister of Pensions what number of men suffering from tuberculosis had applied for pensions and had been refused a pension by his department; the number of men so refused who had appealed against the decision of the Ministry to the appeal tribunal; and the percentage of such appellants who had been granted a pension.—Captain CRAIG replied: I regret that the statistics of the Ministry are not kept in a form that would enable me to answer this question in full, but I may say that during the last 15 months about 2800 claims for pension on account of tuberculosis have been accepted.

WEDNESDAY, JULY 25TH.

Powers of Medical Officers of Health.

Mr. RHYS DAVIES asked the Minister of Health under what Act of Parliament a medical officer of health had power to isolate compulsorily healthy people; and whether he would inquire into the fact that the medical officer of health of Taunton threatened a perfectly healthy family from Gloucester with a period of isolation if they persisted in their refusal to be vaccinated, and in consequence the family returned to Gloucester, where they were examined by the small-pox officials and given a clean bill of health.—Mr. NEVILLE CHAMBERLAIN replied: I am not aware of any Act of Parliament which confers upon a medical officer of health power to order compulsory isolation. As regards the second part of the question I will communicate with the local authority in regard to the action which the medical officer of health is said to have taken in this case.

Health Insurance Contributions.

Major MCKENZIE WOOD asked the Minister of Health what amounts were received in each of the years 1921 and 1922 in England and Scotland, respectively, on account of National Health Insurance contributions; and what was the shortage in each year as compared with the amounts estimated.—Mr. NEVILLE CHAMBERLAIN replied: The amounts of health insurance contributions were approximately as follows: England and Wales, 1921, £22,130,000; 1922, £22,500,000; Scotland, 1921, £2,740,000; 1922, £2,720,000. The shortage of contributions as compared with the amount assumed in the financial basis of the Act—namely, about 48 contributions per insured person per annum—is estimated to be approximately 7 per cent. in England and Wales and 10 per cent. in Scotland.

Cancer Areas.

Mr. ALFRED T. DAVIS asked the Minister of Health whether his department is collecting information with regard to what are termed the cancer areas in this country or on the Continent of Europe; and what were the results, if any.—Mr. NEVILLE CHAMBERLAIN replied: The subject of my hon. friend's question is receiving the attention of the committee which is advising the Ministry on cancer problems, but there are no results which can be published at present.

Birth Control Information.

Mr. BROAD asked the Minister of Health whether his department would raise any objection to birth control information being given at infant welfare centres to married women who desired it by voluntary workers attached to the centres, or otherwise to their being informed, on request, where such information could be obtained.—Mr. NEVILLE CHAMBERLAIN replied: My view is that such information as is referred to should not be given at infant welfare centres, but that women for whom it appears to be needed on medical grounds should be referred to a private practitioner or to a hospital.

Poor-law Authorities and Small-pox.

Mr. ADAMS asked the Minister of Health whether, in view of the fact that public vaccination was controlled by the Poor-law authorities, who had no responsibility in the prevention of small-pox, he would take the necessary steps to transfer their powers in this connexion to the health authorities, who were responsible for the prevention of this disease.—Mr. NEVILLE CHAMBERLAIN replied: This suggestion is under consideration in connexion with the general question of possible amendment of the Vaccination Acts.

Use of Poor-law Hospitals.

Mr. RHYS DAVIES asked the Minister of Health whether, in view of the fact that the voluntary hospitals of the country were crowded and subject to long waiting lists and that a large number of beds were unused in the Poor-law hospitals, he could take some immediate action to remove this anomaly.—Mr. NEVILLE CHAMBERLAIN replied: I do not think I could usefully undertake any general action in the direction suggested, but I should be very glad to consider any proposals which may be put forward by boards of guardians and the authorities of the hospitals for the general use of surplus accommodation in Poor-law infirmaries.

Deaths from Starvation.

Mr. ROBERT RICHARDSON asked the Minister of Health whether he was aware that it was ascertained, by inquests, that in 1921 three persons died of starvation in the unions of Hammersmith, St. Olave, and Bermondsey, in the county of London; whether his department had taken any and, if so, what steps to prevent similar deaths; whether any and, if so, how many deaths in that county in 1922 were found by inquest to have been due to starvation or accelerated by privation; if he could supply particulars as to age, sex, date of inquest, and union concerned; whether any and, if so, what Poor-law officers were examined at the inquest: and whether any of the persons so dying in either year were tramps or homeless.—Mr. NEVILLE CHAMBERLAIN replied: I am aware that three cases of death which occurred in the County of London in 1921 were found by inquest to be due to starvation. The unions concerned were Paddington, Hammersmith, and Bermondsey. In the year 1922 no deaths in the county were found by inquest to have been due to starvation or exposure, and accordingly the third and fourth parts of the question do not arise. The death which occurred in the Hammersmith union in 1921 was that of a homeless man.

Cost of Insulin.

Viscount EDNAM asked the Minister of Health whether he was aware that diabetic sufferers were unable to obtain insulin treatment at a lower cost than 10s. per day, although panel patients under the Insurance Act were obtaining free treatment; and whether he would make arrangements for uninsured persons to obtain this treatment at a lower cost.—Mr. NEVILLE CHAMBERLAIN replied: I am advised that the average cost of insulin is at present about one-third of the figure stated by my noble and gallant friend, though the treatment of exceptionally severe cases such as must go to an institution may cost more. It is within the power of the guardians, on the advice of their medical officer, to pay for the supply of insulin in cases of destitution.

Viscount EDNAM: In view of the importance of this matter has not the time come for the Ministry to control the price?—Mr. CHAMBERLAIN: I do not think so, because the price has been reduced already very materially and I have good hope that it will be still further reduced.—Viscount EDNAM: It is still very high and far above the figure which an ordinary person can afford.

THURSDAY, JULY 26TH.

Ex-Service Men and Medical and Surgical Treatment.

Captain BOWYER asked the Minister of Pensions how many officers and men disabled in the great war had received medical or surgical treatment at the cost of his department.—Major TRYON replied: Approximately 1,500,000 courses of treatment have been provided by my department for the officers and men who were disabled in the great war.

Salford Public Vaccinator and the Regulations.

Mr. TILLETT asked the Minister of Health whether his attention had been called to the fact that the public vaccinator of Salford insisted on vaccinating the child of Mr. R. Headon, of 79, Nora-street, Lower Broughton, in spite of the fact that the period during which a conscientious objection to vaccination might be lodged had not expired, the child having been born on March 10th and vaccination taking place on April 19th; and what steps he proposed taking to prevent this abuse of the regulations.—Lord EUSTACE PERCY replied: My right hon. friend has communicated

Rockefeller Medical Fellowships. — The Medical Research Council announces the award of Rockefeller Medical Fellowships, tenable in the United States of America during the academic year 1923–24, to the following:—

John Crighton Bramwell, M.D. Camb., M.R.C.P., Medical Registrar and Registrar to the Cardiographic Department, Manchester Royal Infirmary.

Norman McOmish Dott, M.B., Ch.B. Edin., F.R.C.S. Edin., Assistant in the Physiological Department, University of Edinburgh.

Helen Ingleby, M.B., B.S. Lond., M.R.C.P., Assistant Physician, Victoria Hospital for Children and South London Hospital for Women.

Hugh Kingsley Ward, M.B. Sydney, D.P.H. Oxf., Member of the Scientific Staff of the Medical Research Council and working in the Department of Pathology, University of Oxford.

It is understood that further awards may be made during the coming academic year.

Association of Certificated Blind Masseurs.—The fifth annual general meeting of this Association was held on July 19th in the Armitage Hall of the National Institute for the Blind, Great Portland-street, London, W., when Sir Robert Jones, the President of the Association, who was supported by Dr. C. Mansell Moullin, Mr. Harry Platt, and Mr. A. H. Tubby, drew the attention of the audience to the excellent report of the year's work.

Irish Hospitals and Lotteries.—The Committee of Dail Earann, appointed to report on the Hospital Sweepstakes Bill, reported to the Dail last week. It suggested the conditions under which it should be legal to promote lotteries on behalf of hospitals in the Free State. During the debate on the report the House was counted out. There is little prospect of the Bill going any further in the life of the present Parliament.

The late Dr. W. A. Walker.—William Abraham Walker, of Southwell, Notts, who died recently at the age of 78, became M.R.C.S. in 1867, graduating M.B., C.M. Aberd. in 1868, and M.D. in 1880. At one time surgeon-major 3rd Derbyshire Regiment and a keen rider to hounds, Dr. Walker had practised little for several years; his loss will be felt by a wide circle of friends.

Public Health in Soviet Russia.—On July 21st Russia celebrated the five years' anniversary of the Commissariat of Public Health when special sessions and conferences were arranged in illustration of medical investigations and medical work in Soviet Russia. The Red Cross Society of Russia states that a special illustrated magazine will be issued under the title, "Five Years of Soviet Medicine" and pamphlets describing the work of the Commissariat in detail and the part played by Russian doctors during the five years are also to be published.

Messrs. Longmans, Green, and Co. announce that the new edition of Sir Edward Thorpe's "Dictionary of Applied Chemistry" will extend to seven volumes, of which the last volume will be largely occupied by a complete index.—Messrs. W. Heffer and Sons, Ltd. (Cambridge), announce the forthcoming publication of "The Internal Secretion of the Sex Gland," by Prof. A. Lipschütz, Professor of Physiology in the University of Dorpat, Esthonia.

Lancashire County Tuberculosis Committee.—The committee has offered to coöperate with the Medical Research Council by affording facilities for experiments with the Dreyer method of treatment. The Council has expressed its thanks for the offer and is considering how best to give effect to it.

Memorial to the late Dr. Joshua J. Cox.—A new operating theatre in the Cottage Hospital in Buxton is to be erected by the friends and patients of the late Dr. Joshua Cox, who in 1914–17 was Principal Recruiting Medical Officer, Manchester area, and in 1917–18 Commissioner of Medical Services for the N.W. region.

The late Dr. F. J. Knowles.—The death at St. Helens on July 27th of Frederick Joseph Knowles, M.R.C.S. Eng., has removed a practitioner who was widely known outside his professional circle. Dr. Knowles was born in St. Helens, and after qualifying in 1885 at once began to practise in his native town. He was a keen Volunteer, retiring in 1910 as Lieut.-Colonel R.A.M.C., and for 30 years he was an examiner to the St. John's ambulance. He took an active interest in athletics, swimming, tennis, and cricket, and was a Freemason. His funeral, which was of a military character, was attended by almost every doctor in the district, and the streets of the town were lined by sympathetic crowds.

Parliamentary Intelligence.

HOUSE OF LORDS.

Wednesday, July 25th.

Therapeutic Substances Bill.

The Earl of Onslow in moving the second reading of the Therapeutic Substances Bill said there were certain medical preparations mainly used for the purposes of injection the strength and purity of which could be tested by analysis. The most important of these were vaccines and certain arsenical preparations and also animal extracts and insulin. The increasing use of these preparations made it necessary to establish measures for their control and regulation so that the public might be insured against danger or accident from their use, and the Bill proposed to bring these substances under control and to allow them to be manufactured in this country only under licence. The conditions of the licence were to be laid down by a Committee which would consist of the Ministers in charge of the Health Departments in this country, in Scotland, and in Northern Ireland, and they would be assisted by an advisory committee. This committee would make regulations to deal with the strength and the tests of the preparations, and they would vary the list in the schedule as scientific development dictated. The testing work would be done by the Medical Research Council so that there would be no extra expense to the Exchequer. Similar provision was made for imported substances. They would only be imported by holders of licences, and when imported they would be subject to the same tests as articles manufactured in this country. The Bill did not interfere with doctors in any way, for it did not apply to a drug prepared by a registered medical practitioner for his own patients or those of another doctor. Foreign countries for the most part had this control, or some similar form of control. The Government did not think that it ought to be possible for substances which had been rejected as not being up to the standard in the United States to be sold in this country without any penalty, as that might perhaps cause great danger to the British people.

The Bill was read a second time.

Thursday, July 26th.

Smoke Abatement Bill.

The Earl of Onslow in moving the second reading of the Smoke Abatement Bill explained that it was not proposed to proceed further with the measure this session and the remaining stages would be taken in the autumn. All smoke, and not merely black smoke, was brought within the scope of the Public Health Act, 1875, and included within the term "smoke" were soot, ash, grit, and gritty particles. The fines for breaches of the law were increased, but the maximum penalty was somewhat reduced. Section 334 of the Act of 1875 was extended so as to include the processes of re-heating and annealing, hardening, forging, converting, and carbonising iron and other metals. At the end of five years any of these processes may be excluded from the section by Provisional Order. The Bill gave power to local authorities to fix their own standards for the measurement of black smoke. By Clause 3 the Minister of Health was given power to make orders extending the list of noxious or offensive gases mentioned in Section 27 of the Alkali Works Regulation Act, 1906, and the list of works mentioned in the schedule to the Act.

Viscount Novar, Secretary for Scotland, said he hoped to introduce a separate Bill for Scotland in the autumn.

The Bill was read a second time.

National Health Consolidation.

The Earl of Onslow moved the second reading of the National Health Insurance Bill, which he said was purely a consolidating Bill.

The Bill was read a second time and referred to a joint committee on consolidation Bills.

Monday, July 30th.

Bills Advanced.

The Dentists Bill and the Therapeutic Substances Bill passed through Committee.

HOUSE OF COMMONS.

Tuesday, July 24th.

Children Employed in Mines.

Mr. Dunnico asked the Secretary for Mines whether he was aware that boys of 14 years of age were employed in the coal-mines of this country, not only during the day but during the night also; that these boys in some areas commenced their duties between midnight and 3 o'clock in the morning; and whether he was prepared to consider the

Miners' Nystagmus.

Mr. PALING asked the Secretary for Mines whether any statistics were yet available showing the number of cases of miners' nystagmus at pits where electric lamps were used, as compared with pits where oil lamps were used.—Lieut.-Colonel LANE-FOX replied: No, Sir, as I informed the hon. Member on March 13th, such statistics would be of little value in themselves owing to the number of factors involved.

Penrhiewtyn Hospital.

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MURRAY.—On July 28th, after an operation, Flora Murray, C.B.E., M.D., D.P.H., of Harley-street, W., and Paul End, Penn, Bucks, aged 54.

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the guardians in reference to this case, and I am rmed that the public vaccinator called at the house of Headon on April 19th and offered to vaccinate the child; the mother did not raise any objection or demur in any; and that she has confirmed this statement but added she thought vaccination was compulsory. There is vidence that the public vaccinator insisted on vaccinating child without the parent's consent, or of any abuse of regulations which calls for any special action on the part he Minister. I may add that the exemption certificate onscientious objection is dated 25 days after the child been vaccinated.

Cream, Milk, and Cheese Standards.

r. **Hurd** asked the Minister of Health what was the ent position of the movement in his department to carry the recommendations of the departmental committee in ur of standards of quality for cream, dried milk, and se.—Lord E. **Percy** replied: The draft regulations ing with dried milk have now been published in accord- with the requirements of the Rules Publication Act, . As regards cream and cheese I would refer my friend to the answer which my right hon. friend gave his subject on the 11th inst.

FRIDAY, JULY 27TH.

Deaths from Small-pox.

r. **Rhys Davies** asked the Minister of Health how many e small-pox deaths registered during 1922 were classified accinated, how many as unvaccinated, and how many oubtful as regards vaccination; and how many of these hs occurred in children under 5 years of age.—Mr. ILLE **Chamberlain** replied: Of the 27 deaths attri- d to small-pox during 1922, 12 occurred in persons who been vaccinated at some time in their lives. Ten ng unvaccinated persons, three among those who were to have been vaccinated but who showed no signs of ination, and two among those previously unvaccinated were vaccinated during the incubation period of small- There were four deaths among children under ars of age; of these three were unvaccinated, and one vaccinated during the incubation period of small-pox, had not previously been vaccinated.

MONDAY, JULY 30TH.

Medical Services for Kenya Natives.

reply to Mr. **Morel**, who asked the Under-Secretary he Colonies whether, in view of the recent declaration M. Government that the administration of the Colony enya should be based upon the principle of trusteeship he native population, he would take steps to secure the principle be adopted that at least one-fifth of the taxes paid by the natives should be returned to them chnical education, medical service, and agricultural uction.—Mr. **Ormsby-Gore** replied: I should be glad nsistently with the general financial position of the y, a larger proportion of revenue could be devoted to es for the direct benefit of the native. The matter not be lost sight of, but I do not think that any fixed ntage can be laid down.

Conscientious Objection to Vaccination.

Trevelyan Thomson asked the Minister of Health er, in view of the issue of Circular No. 424, dated 23rd, to boards of guardians, a statutory declaration nscientious objection to vaccination in the form set the Schedule to the Vaccination Act, 1907, would be ted by vaccination officers in place of the new form issued by the Ministry.—Mr. **Neville Chamberlain** d: The form of statutory declaration of conscientious ion to vaccination which will be issued by my depart- to vaccination officers will be the form set out in the ule to the Vaccination Act, 1907. The Act provides these statutory declarations must be made in that or in a form to the like effect.

Lansbury asked the Minister of Health whether he explain why he had issued an order requiring a making a statutory declaration of conscientious ion to vaccination to make such declaration only on n supplied by the vaccination officer, in view of the ion in the Vaccination Act, 1907, Section 3, permitting e of the form set out in the Schedule to the Act or a to the like effect.—Mr. **Neville Chamberlain**: The Member appears to be under some misapprehension. Vaccination Order recently issued states that these ations must be made in a form which may be obtained the vaccination officer or in a form to the like effect. rm issued to vaccination officers will be the form set the Schedule to the Vaccination Act, 1907.

Edwards asked the Minister of Health whether he ecided to alter the system of obtaining forms under exemption from vaccination can be obtained and has been in force for 15 years; and whether, in view of Section 3 of the Vaccination Act of 1907, he would state his authority for making such order.—Mr. **Neville Chamberlain**: The answer to the first part of the question is in the affirmative. As regards the second part, the authority for the Vaccination Order recently made is contained in Section 15 of the Vaccination Act, 1871, and I find nothing in the Act of 1907 which prescribes the manner in which forms for the purpose of statutory declarations under that Act are to be obtained.

Court of Appeal for Lunatics.

Mr. **Robert Richardson** asked the Minister of Health if he was aware that the recent transfer of the lunacy department by Order in Council from the Home Office to his department had had the result of throwing into abeyance many matters connected with legal sanction and the liberty of the individual; and, in view of the fact that the scope of his Ministry did not extend to judicial investigation, would he consider the possibility of instituting a court of appeal for persons unjustifiably confined in asylums.—Mr. **Neville Chamberlain** replied: The transfer of certain powers under the Lunacy Acts to the Ministry of Health by Order in Council under the Ministry of Health Act has not had the result suggested by the hon. Member; the second part of the question does not, therefore, arise.

Nurses' Registration Rules.

Dr. **Chapple** asked the Minister of Health whether he was aware that, under section 3 (2) (*c*) of the Nurses' Registration Act, 1919, rules were to be made enabling persons who had been bona fide engaged in practice as nurses under certain conditions to be admitted to the register, providing application was made within a period of two years after the date on which a rule first came into operation, and that a rule first came into operation on July 7th, 1923; could he now say whether persons to whom this rule applied might, if otherwise qualified, be admitted to the register; and would he say whether he had satisfied himself that the General Nursing Council was correctly interpreting the Act and the new rule.—Mr. **Neville Chamberlain** replied: The hon. Member has not quoted the Act correctly. The wording of the section in question is "the date on which the rules to be made under the provisions of this paragraph first come into operation," and I am advised that the effect of the provision is to allow a period of two years from the date when the first body of rules came into operation. This date was the 14th July, 1921, and the two years' period having now expired the General Nursing Council have no power to admit further applications for registration as existing nurses.

Medical Women and Nurses in Fiji.

Mrs. **Wintringham** asked the Under-Secretary of State for the Colonies whether he could state the present numbers of men, women, and children respectively in the Indian community in Fiji; whether there were any fully trained medical women, nurses, or midwives in the islands and, if so, of what nationality; and what arrangements were made by the Fiji Government for the medical treatment of the Indians.—Mr. **Ormsby-Gore** replied: The census of 1921 showed 23,407 Indians under 15 years of age, 24,886 men and 12,326 women. There were two European women medical practitioners (one of whom was presumably the Government medical officer whose agreement recently expired), and women nurses numbering 33 Europeans, 7 half-castes, 31 Fijians (not including those in the native villages), and 5 Indians. No distinction between races is made by the Government medical and hospital service, which cost in 1922 £51,319, not including buildings; that is, over 11 per cent. of the revenue.

Prison Governors as Medical Officers.

Mr. **Hayes** asked the Secretary of State for the Home Department the number of prison governors who were authorised to act also as medical officers; and whether he proposed to make any change in this practice.—Mr. **Bridgeman** replied: No change in the present practice is contemplated. There is only one governor holding the necessary qualifications to act as a medical officer.

TUESDAY, JULY 31ST.

Maternity Benefit.

Mr. **Neil Maclean** asked the Under-Secretary to the Scottish Board of Health whether it was the intention of the Scottish Board of Health to publish the Report of the Joint Committee set up in 1920, and composed of representatives from the Consultative Committee on Local Health Administration and General Health Questions and the Consultative Committee on National Health Insurance (Approved Societies' Work) to consider and report on the interrelation of maternity benefit under the Insurance Act and the maternity and child welfare schemes of local authorities; and, if so, when.—Captain **Elliot** replied: It is not proposed to publish this report.

Miners' Nystagmus.

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Notes, Comments, and Abstracts.

TYPHUS FEVER EPIDEMIC AMONG THE GREEK REFUGEES.

By Sir Patrick Hehir, K.C.I.E., C.B., C.M.G., M.D.Brux., F.R.C.S., F.R.C.P.Edin.,

MAJOR-GENERAL, I.M.S. (RET.); MEDICAL ADVISER, BRITISH RED CROSS SOCIETY IN GREECE.

(*Concluded from p. 210.*)

Complications.

Bronchitis of greater or lesser severity is present in a large proportion of cases. It usually appears early, and if persistent and implicating the bronchioles, is often fatal. Bronchopneumonia is one of the commonest complications, usually affecting the bases of both lungs. Pleurisy is much less frequent, but there are few large typhus wards in which a case may not be found. In one infectious diseases hospital two of these cases were being operated on for effusion during my visit. Diarrhœa, very common in the later stages of the disease, usually begins on the eighth or ninth day, is often difficult to check, and if severe and persistent adds much to the patient's danger. Many medical men in Greece dealing with typhus on a large scale, spoke to me of implication of the heart muscles in the disease; they considered that in most cases there was a certain amount of myocarditis. I saw one case of acute endocarditis as a complication. Cardiac dilatation is likewise often present, and in the acute form is not uncommon as a terminal event in fatal cases. Parotitis is one of the more serious complications; I saw altogether 20 of these cases, as many as three in one ward of 30 patients; in two the swelling was so great and universal in the face and neck that the features were obliterated. In one hospital with 156 cases, there were only three of parotitis, and in another with 86 cases there was none. In the latter, during the early months of the epidemic, there had been altogether 12 cases. Otitis media occurs in a small percentage of cases; it may become chronic. We have seen a few of these distressing middle-ear infections among our refugees who return from the infectious diseases hospitals with a chronic suppurative discharge from one or both ears, the hearing being always defective; when both ears are involved, there is little hearing left. Actual deafness is a marked feature of many cases of typhus during the later stage of the disease; this is quite distinct from the dullness of intellect that exists at this stage. One or more cases of conjunctivitis and keratitis are often met with in typhus hospitals. Using a disinfectant eye-wash every four hours from the time of admission in one hospital stopped this form of complication altogether. Gangrene implicating the toes occasionally occurs; I saw two such cases where amputation was carried out; they recovered. Bedsores are common, especially when nursing is not of a high order.

Mortality.

There seems to be a remarkable difference in the intensity and mortality of typhus in different areas. The average mortality in the infectious diseases hospitals near Athens is roughly 10 per cent.; it is, however, much higher in some towns, such as Corfu, Patras, Volo, &c. It varies greatly at different ages, being very high (50 per cent. in some towns) in refugees of 50 years and over. The high death-rate in the old may be associated with the economic conditions of their life as refugees; I was inclined to believe that with the best nursing and care a fair proportion of these old people would recover. This belief is borne out by the experience of the Salonica Hospital. Among the 32 convalescents I saw in it on May 14th, there were one man of 65, one of 62, one of 57, two of 55, one woman of 61, one of 58, and two of 56. It seems to be largely a question of getting these old people under good nursing and treatment at an early stage of the disease. The mortality is very slight in children; their attacks are comparatively mild. I have been impressed with the higher mortality in women than in men between 20 and 50.

Prognosis.

Many circumstances affect the prognosis, but the main factors are age, sex, and the standard of efficiency in nursing in operation. Many children escape the disease altogether; those attacked usually get it in a comparatively mild, though characteristic form. Adolescents and young men (of whom we have had few) appear to struggle through the disease satisfactorily. We have had a high incidence of attacks amongst old men and women. After the age of 55 their chances of recovery are much reduced. In the Salonica Hospital, with good nursing and treatment, the typhus mortality was only 5·8 per cent., and the complications were fewer and less severe than in other infectious diseases hospitals. Complications are frequent and serious among those who are badly nursed and cared for; the mortality rises with the degree of inefficiency in nursing. In another infectious diseases hospital visited the mortality was only 7 per cent., and the complications, though serious, were less so than in most other hospitals. In two other infectious diseases hospitals the mortality was 11 and 12 per cent. respectively, and the complications formed the worst phase of the disease; in both these hospitals the nursing was defective. In none of these hospitals were there complete arrangements for protection of the sick attendants, nurses, and doctors from infection. Medical men, nurses, and all sick attendants looking after typhus patients should be thoroughly protected from lice by suitable cotton or linen clothing from head to foot before commencing their work daily, and have a bath and a complete change of clothing after finishing their day's work. Even with these precautions infections will occur during an epidemic, but without them infection is inevitable sooner or later.

Treatment.

When typhus is diagnosed the case should be sent to hospital from the refugee camp at once. To this rule we make but few exceptions; there were instances in which members of our staff were attacked and sent to isolation wards of ordinary general hospitals. It was a great concession accorded to us, and none of these cases proved fatal. The refugees were greatly opposed to our sending their infected relatives to infectious diseases hospitals, but this measure is necessary for the safety of the uninfected. Some definite routine plan must be adopted in admitting typhus fever cases into hospital and distributing them in wards. The first requirement is a receiving room to which all patients are primarily brought. Here the hair of the head is rapidly cut off with a machine clipper, the hair of the axillæ and pubes being shaved off and all hair burned. The receiving room should communicate with the room or other area containing the steam-disinfector on the one hand and with the bathroom on the other; the latter should lead to the dressing-room. After removal of the hair the patient is put on a stretcher and conveyed to the room containing the disinfector. Here everything he brings with him is discarded and disinfected. He is next taken to the bathroom and bathed, and then put on a clean stretcher and removed to the dressing-room, where he receives a suit of clean hospital clothes, being then taken to a ward. This routine must be thoroughly carried out if the wards are to be kept free from infected lice. Nothing that the patient brings to hospital should enter the ward. The carrying out of a similar routine in delousing all inmates of refugee camps is of paramount importance. All these arrangements have, of course, to be improvised in dealing with refugees. The most vitally important measure necessary at the present time is the isolation of all cases of typhus to prevent its dissemination. Thoroughly deloused typhus cases are perfectly innocuous to the uninfected, and if delousing arrangements are quite efficient there is no reason for putting them in separate wards. Personally I have seen no infectious diseases hospital in Greece that inspired complete confidence.

Typhus patients should be kept in bed throughout the pyrexial stage of the disease and for at least a week afterwards. They may be dieted on practically anything they can assimilate; the lowered digestive powers indicate the desirability of giving such foods as soups, jellies, macaroni, porridge, fish, eggs, and so forth. The more simple liquids taken—lemonade, soda and milk, weak tea, &c.—the better. Most physicians in Greece are opposed to the use of antipyretic drugs. If the temperature calls for reduction this is readily effected by cold sponging, or, if a decided effect is required, packing in cold wet sheets. There is great temptation to use aspirin or some other antipyretics; it certainly relieves the main symptoms, but it masks the patient's state and eventually depresses him considerably. In the early stage, when sleeplessness and irritability are present, small doses of morphine give satisfactory results; large doses are to be avoided as they also mask the condition and in later stages are altogether too depressing. The morphine may later on be replaced by paraldehyde or sulphonal if it is called for. The most popular stimulant is hypodermic injections of camphor (gr. 2 to 5 in 1 c.cm. of olive oil or in ether put up in ampoules) every four hours; in severe cases with threatened heart failure it is alternated with digitalin or strophanthin. Though little used in this epidemic I am convinced that the careful administration of alcohol (in the form of brandy or whisky) would tide many cases over the critical period of the disease, the ninth to the fourteenth day. It is too expensive for general use in these cases among refugees. Saline infusion subcutaneously is very commonly used and is well spoken of, as much as 1½ to 2 pints being given daily from an early stage. Some cases die of heart failure during convalescence, owing it is said, to overstrain of the myocardium, which is seriously involved. This involvement of the heart muscle demands care in convalescence; the only treatment required appears to be a tonic of strychnine, strophanthin or digitalis, and iron, easily assimilable nourishing food, and gentle exercise. Normally cases are kept in hospital 14 to 21 days from the first day of apyrexia. With great pressure on hospital accommodation the cases are sometimes discharged at the end of the first week; as they are then (if they again become lousy) for some days infectious to those around them, their freedom from lice must be assured. Eye affections, especially conjunctivitis and keratitis, may to a large extent be prevented by the use of suitable collyria from the beginning; parotitis, otitis media, and possibly pulmonary complications may be reduced by the use of gargles, mouth-washes, and swabbing the throat with appropriate antiseptics.

The treatment for typhus adopted in the infectious diseases hospital at Salonica is as follows. *Diet.*—Milk 44 ounces (1 oke) daily, meat soup twice a day, egg-flip twice, lait caillée (yaourt) once a day, sour milk and lemonade ad lib. This is the adult diet, modified as required. *Drugs.*—The following are most generally employed: Camphor (gr. 2 to 5) in olive oil (made up in ampoules) every four hours or so subcutaneously after the first week; adrenalin one ampoule daily; spartein and strychnine on alternate days; caffein once a day. When necessary, either sulphonal or paraldehyde is used to induce sleep. Occasionally during the first week small doses of morphine are given to calm the patient. Purgatives are not given; constipation is the rule, and it is relieved by simple enemata. I was surprised to find so little serious diarrhœa and rectal incontinence in the later stages of serious cases as compared with those in other hospitals, even our own. For headache and noisy delirium ice is applied to the head; for high temperature cold sponging, and where hyperpyrexia threatens cold sheet packing is employed. The eyes are washed with boric acid lotion, the mouth with an antiseptic, and the throat swabbed every four hours; a gargle and mouth-wash are given if the patient can use them. Since this latter routine has been adopted complications have greatly decreased. Saline solution is infused into the subcutaneous tissues twice a day or so, 12 ounces at a time. Serum treatment is not adopted. A trial was made of defibrinated typhus blood incubated for three days at 37° C. with ox-gall, and then heated to 60° C. for two hours. The dose given was 2 c.cm. once a day. It was used in 50 cases with no obvious good effects and then abandoned. Massage is looked upon as a valuable accessory to the treatment and is carried out in every case twice a day.

Very little is done in this epidemic in connexion with specific treatment by the use of sera of typhus convalescents.

Prophylactic Inoculations.

A lasting immunity to typhus is established by a previous attack. In Asia Minor and the Levant generally typhus is almost endemic, and it is probable that many of those refugees who have escaped in the present epidemic have acquired immunity by a previous attack in childhood. It is possible, also, that an immunity of limited duration may be acquired by the inoculation of the virus of the disease obtained from typhus cases in the early stage of the disease. As a substitute for a prophylactic vaccine the blood of typhus fever cases has been inoculated and the virus thus introduced in a living state. The killed virus is used here.

Inoculation against typhus is being adopted in Greece; it is at present experimental, and, of course, voluntary. I was inoculated a few days after my arrival in Greece and now all employed on British Red Cross work have been done. There is absolutely no reaction. Dr. Georges Blanc, director of the Institut Pasteur Hellénique, who is on special duty in connexion with this work, tells me that he has not heard of any inoculated person acquiring the disease, but expresses no opinion regarding its prophylactic effects at present. I understand that if favourable reports regarding its value are forthcoming in due course, the Greek Government propose making inoculation compulsory among refugees occupying infected areas.

Prevention.

The carrying out of preventive measures in a refugee camp is comparable with nothing met with in ordinary civil or military life in the United Kingdom; the closest approach to it I know of is work among famine-stricken areas in India. So far as the area allotted to the British Red Cross is concerned, the typhus epidemic is now well under control, and it is anticipated that the disease will die out within the next four or five weeks. It is beyond the power of human effort completely to eradicate it under existing circumstances. In our jurisdiction we have had only three cases during the last 10 days. I confess that initially I had hoped for more radical results, but I had not then had my later disappointing experience in all work where Greek refugees form part of the organisation. With regard to our particular charge in and near Athens I recently wrote to the British Red Cross in London that throughout March much energy was concentrated in endeavouring to reduce, if not eradicate, the typhus epidemic among our refugees. It was recognised that while the typhus outbreak lasted there must be a great deal of apprehension among the refugees themselves and a certain amount of risk to the staff in their daily work. A sight deserving of permanent record is that of the British nursing sisters examining the heads and clothes of the refugees for lice and nits, and coercing the hosts of these insects against their will to be de-verminised in the bathrooms. All men's and boys' heads were shaved, and all girls up to the age of 14 had their hair bobbed. All cases of actual typhus, of course, had their heads shaved. These were severe measures and led to some mutinous display among the refugees, but this exhausted itself when it was recognised that these were compulsory measures adopted for their personal safety. Our nursing sisters also used on the heads of the refugees in camp the mixture of equal parts of kerosene and olive oil we employ to free nits from hair, and they distributed N.C.I. powder (naphthalene 96 parts, creosote 2 parts, iodoform 2 parts), which was in little bags to be worn continuously for a week, when a fresh bag is issued. The idea is that the heat of the body helps to vapourise the ingredients and creates a louse-destroying atmosphere next the skin and clothes.

I believe it to be well worth while in every camp to endeavour to educate the people in regard to the nature of typhus and the principles that underlie its eradication and prevention. We placarded leaflets in this connexion and also had them read out periodically for the benefit of the illiterate. We also posted up such short notices as: "Lice cause typhus fever"; "It is disgraceful to have lice in the head," and so on.

The specific measures now indicated appear to be—(1) dispersion of refugees from overcrowded towns to rural areas as much as possible; (2) an increased supply in many towns of water which should be available to, or at least be within easy reach of, every house. In some camps the water-supply is decidedly defective, and bathing arrangements, steam-disinfection of clothing and bedding, and ordinary laundry-work are seriously interfered with. The Greek administration is endeavouring in all possible ways to remove this difficulty.

Every effort to quarantine contacts has failed, which, all things considered, was to be expected. All we want is that the contact should be definitely watched for 21 days, the time laid down as the maximum incubation period. We endeavoured, as far as was possible, to render these certificated people free from lice; we felt that if thus free they could not communicate typhus, even if they acquired it themselves in the meantime. The quarantining of contacts in a small country which contains over a million and a quarter of refugees, many thousands of whom are contacts and are either in search of work or have daily to pass in and out of the camps to and from their work, is an impossibility. We hope that during the summer the epidemic will come naturally to an end by cessation of the multiplication of lice in unfavourable meteorological conditions, and that by the beginning of the next typhus season the economic and other conditions at present antagonistic to preventive work will have altered for the better.

PREVENTION OF DECAY OF TEETH.

A LEAFLET for the use of parents, dealing with the causes of decay in teeth and its prevention, has just been issued with the approval of the Council of the Society of Medical Officers of Health. The leaflet reads as follows:—

Decay of teeth is caused by the fermentation of food that sticks on or between the teeth after meals. Acid is formed from the food, and this acid eats a hole into the teeth. It is only the "starchy" and "sugary" foods (see below) that form acid in the mouth.

It is most important that the jaws should be well grown and the teeth regular. This is brought about by breathing through the nose from birth onwards and by chewing and gnawing. If the jaws are small and the teeth overcrowded, mastication (chewing) cannot be properly performed, and the food will be left clinging to the teeth after meals and the teeth will decay.

Seven Rules.

In order that the jaws and teeth shall grow properly and the teeth kept clean and free from decay, you should observe the following rules:—

(1) As soon as an infant needs food other than milk (8 to 9 months) give it in a solid form, such as crusty bread, twice baked bread, or crisp toast, thus compelling mastication. Do not give bread soaked in milk or milk thickened with flour or other starchy foods, such as most patent foods. Encourage the child to chew and see that it breathes through its nose. In these ways good habits of mastication will be formed.

(2) As the child grows up you should still give most of the food in a solid form, compelling mastication. Food, other than milk, should rarely be taken in a liquid form. Vegetables and meat should not be minced and soaked in gravy. Bread should not be eaten new, and it should have plenty of good firm crust.

(3) After the first two or three years of life the child should have three meals a day and no food between.

(4) It is not advisable to drink at meal times, but plenty of water should be taken between meals. Milk is a food, and should only be taken at meal times, and must be followed by a tooth-cleansing food.

(5) All meals should be finished with a cleansing food (see below).

(6) Sweets, chocolates, and biscuits are very harmful to the teeth, if taken the last thing at night. They should only be taken at meal times, and should be followed by a cleansing food. The custom of giving milk and biscuits the last thing at night should not be allowed.

(7) Correct feeding and chewing are the best means of preventing decay of the teeth, though the intelligent use of the toothbrush will be found helpful.

If decay of the teeth or tenderness of the gums is noticed, the child should be taken to a dentist. Such conditions prevent mastication and bring about further decay. It is important for the sake of the child that the nursing and expectant mother should also go to the dentist if her teeth are in a bad condition.

Examples of the Various Kinds of Food.

Starchy Foods.—Potatoes; rice, tapioca, sago; bread, biscuits, &c.; oatmeal porridge; most patent foods.

Sugary Foods.—All foods to which sugar is added; sweets of all kinds; honey, syrup, jams, marmalade; milk.

Tooth Cleansing Foods.—Fresh fruits: apples, oranges, nuts; raw vegetables: lettuce, watercress, celery, radishes, onions; crusts[1] of bread, crisp toast, twice-baked bread; meat, fish, bacon.

The leaflet may be obtained from John Bale, Sons and Danielsson, Ltd., 83–91, Great Titchfield-street, London, W. 1., price 1*d.* each, 3*s.* 9*d.* for 100.

TEREBENE TOILET SOAP.

Terebene (Terebenum) is a well-known powerful antiseptic, disinfectant and deodorising liquid and its distinctive smell makes it particularly suitable for combination with toilet soap. The glycerine soap supplied by Messrs. F. S. Cleaver and Sons, Ltd., Honey Soap Works, Twickenham, Middlesex, a sample of which has reached us, has behind it a reputation of 50 years, and its soothing and antiseptic qualities recommend it as excellent for the toilet. Attention has already been drawn in these columns to the value of "Talcum," also supplied by this firm, as a pure talc powder for use in the nursery and wherever a dusting powder of this kind is indicated.

QUEEN MARY'S CONVALESCENT AUXILIARY HOSPITALS, ROEHAMPTON.

A statement has been issued by the committee of the hospitals dealing with the work accomplished therein from 1915 to 1923, and with plans for the future. Approximately 41,000 men required artificial legs and arms as a result of the war; the majority of these cases were dealt with at Roehampton House, opened on June 28th, 1915, with 25 beds, and later increased to 224 beds in October, 1915, to 550 beds in June, 1916, and to 900 beds in June, 1918. Since June, 1915, nearly 23,000 new patients passed through the hospitals, and over 47,000 cases were readmitted for second limbs and repairs. In addition, since January, 1918, nearly 20,000 cases were dealt with through the post. In 1916 instructional workshops and an employment bureau were opened in connexion with the institution; 8453 men received training in various trades and commercial classes, employment was found by the bureau for 4987 men on discharge from hospital, and for 4166 men arrangements were made for training in various trades after discharge from hospital. The instructional workshops are now closed as, happily, most of these disabled men have found suitable employment.

Now that practically all officers and other ranks have received their duplicate limbs the number of in-patient beds is 250. The out-patient department has, however, increased very considerably; the average attendance is about 52 per day, rising in busy seasons to as many as 90. Dover House (adjoining Roehampton House), for the use of officers, is now closed, and arrangements have been made for their accommodation at Roehampton House, where 13 beds are available. In consequence of the number of surplus beds, arrangements are being made with the Ministry of Pensions for the accommodation of 500–600 general medical and surgical cases from the Special Surgical Hospital, Shepherd's Bush, which is closing at the end of the year. This will necessitate a further large capital expenditure for the alteration of existing huts and the erection of new semi-permanent wards, operating theatres, &c. The care of the limbless patients is in no way to be interfered with by this arrangement, and it is hoped to further extend the benefits of Roehampton to a limited number of railway employees and others who have the misfortune to lose their limbs in the course of their employment.

It is hoped that support by donations and endowment of beds may continue, so that the committee may be able, with the help of the capitation grant received from the Government, to maintain the institution in its present high state of efficiency. The hon. treasurer of the hospital is Sir Charles H. Kenderdine, K.B.E., 12, Little College-street, London, S.W. 1.

PUBLIC HEALTH IN SOUTH AFRICA.

The Official Year Book of the Union of South Africa[2] contains a chapter devoted to public health and hospitals in the Union. The history of public health prior to the Union and from 1910 onwards is briefly traced, and particulars are given as to the appearance and prevalence of certain diseases, among which are the following: Cholera has twice appeared since 1888 in ships bound from Asiatic ports, but no epidemic has occurred on land. Diphtheria occurs throughout the Union, especially during the colder months, but serious outbreaks are rare. Bacterial dysentery of a mild type is not uncommon in summer, but amœbic dysentery is comparatively rare. The annual notifications of typhoid or enteric number between 4000 and 5000. South Africa suffered heavily during the influenza epidemic of 1918, there being 139,471 deaths up to the end of November of that year. Leprosy, which existed among the Hottentots before the arrival of Europeans at the Cape, had been separately dealt with by several of the component States before the Union came into being; the total number of lepers of all races segregated at the end of 1918 was 2230, and the number of unsegregated lepers is estimated to exceed 1000. Malaria is endemic in parts of Zululand and of the Transvaal, and at times becomes epidemic over wider areas, but European settlements and increase of cultivation and drainage is circumscribing the areas where the disease is endemic. Plague was unknown before 1899, but since that date numerous small epidemics have occurred, chiefly traceable to rats in shipping from India and South American ports. Small numbers of deaths were reported almost annually from 1912 to 1921, but no infections in rodents or other animals were discovered. In 1921 the existence of epizootic plague in certain wild rodents in the Orange Free State was established. There have been many severe epidemics of small-pox since the introduction of the disease in 1713; after the Cape Parliament Public Health Act of 1883 was passed and vaccination became compulsory, the outbreaks have almost all been of the mild "amaas" or "kafir-pox," so called because natives are chiefly affected. Tuberculosis, widely disseminated when from about 1880 onwards tuberculous Europeans began to come out to the dry elevated highlands of the interior, is now prevalent among the coloured and native population. As regards sanitation, considerable attention has recently been paid to water-supply, sewerage, public slaughter-houses, &c., in most smaller towns and in many villages. Maternity and child welfare is attracting an amount of interest which has greatly increased during the last few years. Most municipalities and some other local authorities have health officers and departments attached to the local authority, which is responsible for control of sanitation, outbreaks of infectious disease, &c.; health and medical work, for which the Union Government is responsible, is carried out by means of medical officers known as district surgeons, a few of whom in large centres are whole-time officers, the remainder combining part-time Government work with private practice. In each seaport a port health officer is appointed by the Union Department of Public Health (established 1919) to carry on the health inspection and control of vessels, and to assist immigration officers, in an advisory capacity, with regard to the physical fitness of immigrants to enter the Union. Tuberculosis is specially cited as a disqualification, special permission being required for a person suffering from the disease to enter the Union. Other sections of the Year Book are as useful and accurate as is the chapter here summarised.

For an extension of Bury Infirmary, to take the form of a children's hospital and to serve as a war memorial, over £40,000 are in hand. About £10,700 will be expended on the building, and the balance, which it is hoped to raise to £30,000, will be devoted to endowment.

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[1] The coarse whole-meal flour is best for this purpose.

[2] And of Basutoland, Bechuanaland Protectorate, and Swaziland. Fifth year. 1922. Pretoria: Government Printing and Stationery Office. Price 5*s.*

Post-Graduate Lectures

ON THE

SURGERY OF THE THYROID GLAND.

Delivered at the London Hospital on June 8th and 15th, 1923,

By A. J. WALTON, M.S. Lond., F.R.C.S. Eng.,

SURGEON, LONDON HOSPITAL.

LECTURE II.*—EXOPHTHALMIC GOITRE.

THE problem of Graves's disease or exophthalmic goitre is even more difficult of solution than the problems of colloid goitre or of simple adenoma. There are so many gaps in our knowledge of this mysterious disease that agreement is far from being reached as to its nature and cause. As McCarrison[21] has pointed out, there has been little or no study of its epidemiological nature, and although much is known of the distribution of endemic goitre there is at present no such knowledge of a similar distribution of Graves's disease. In England there are two distinct types—those which supervene on colloid goitre, and those which start in previously normal people. The former is the less common, and in endemic areas such as Berne and the Gilgit and Chitral Valleys, Aarau and McCarrison[21] have shown that this variety is distinctly rare. In it the ætiological factors of hereditary and general infection will be similar to those of colloid goitre, but in the primary variety they appear to have a less definite bearing.

Pathology.

Moebius[25] first put forward convincing evidence to show that the disease was dependent upon excessive secretion of the thyroid. Since that time evidence has been accumulating that the symptoms are always associated with a change in the gland. From time to time cases are described in which there is no visible enlargement of the thyroid, but, as Kocher[18] and Berry[4] have shown, *no one* has ever demonstrated that a case of Graves's disease can occur with a normal thyroid. The size of the thyroid will vary considerably according to whether there has been a previous colloid enlargement or not. To the naked eye three distinct varieties may be recognised, and it is well to distinguish these since they are associated with a somewhat different symptom-complex. For convenience one may describe these three varieties as the colloid type, the vascular type, and the nervous type. The first variety has very similar characteristics to that of a colloid goitre. There is a much enlarged smooth mass which is semi-transparent from the presence of colloid, but on section there has been a considerable proliferation of the epithelium, and hence the colloid spaces are not nearly so distinct even to the naked eye. Remains of the distended vesicles are, however, seen scattered throughout the cut surface, and in some cases the cellular change may not be sufficiently pronounced to be noticeable to the naked eye, the gland then appearing to be a simple colloid goitre. The vascular type, which is found more commonly in relatively young women, shows also a smooth uniform enlargement of the whole gland, but to a less degree than that which supervenes on a colloid goitre. The cut surface shows a uniform granular or fleshy appearance, so that manifestly it is richly cellular. Little or no trace of colloid can be seen. The third or nervous type is a rather smaller thyroid which is found more commonly in people of a later age, generally at or about the menopause. Not only is the gland relatively smaller, but it is rather more irregular and nodular. The cut surface has a much more lobulated appearance, so that portions of the gland stand up and give somewhat the appearance of multiple small adenomata. They have, however, no definite capsule, although the fibrous stroma is more in evidence and bands of fibrous tissue pass between the adenomatous masses. As with the vascular thyroid, each of these areas is finely granular and shows little or no colloid. All three varieties are extremely vascular. At operation they are found to have enormously dilated veins and very large arteries, and the cut surface bleeds with extreme freedom. The microscopic section shows a very characteristic appearance. A well-established case will show a very great cellular hyperplasia. So great will have been the proliferation of the cells lining the acini that in the greater part the gland will appear to be a solid cellular mass. Here and there, however, small acini can be seen. Even in these there is some proliferation of the epithelium with infolding of the walls of the acini. In these spaces there is a small amount of poorly-stained colloid. If the change has supervened upon a colloid goitre there will still be the large spaces containing colloid material, but there will be very considerable proliferation of the interacinar epithelial cells and some proliferation in the acinar walls with consequent infolding. The characteristic microscopic picture, therefore, is a great increase of the epithelial elements and the presence of only a small amount of poorly-stained colloid. Occasionally an exophthalmic goitre may be associated with an adenoma, a condition which must be sharply distinguished from the mild amount of hyperthyroidism which is found with a fœtal adenoma. That portion of the thyroid, apart from the adenoma, will always show much cellular proliferation, whereas the adenoma may be of the colloid type. In the fœtal adenoma the proliferation is limited to the encapsuled growth.

Ætiology.

Like other diseases of the thyroid, this condition is much more common in females than in males. In my own series[31] there were 129 females and only 10 males—that is, a proportion of 13 to 1. Sir Hector Mackenzie[23] found in his series that the proportion was 10 to 1, and this is the figure usually accepted. Murray,[25] however, made the interesting observation that in his recent figures the proportion of males is increasing, for whereas in 120 cases up to 1903 the proportion was 10 to 1, in 300 cases between 1911–21 there were only three females to one male. He raises the interesting suggestion that as the modern male is becoming more highly-strung and nervous in character, so he may be becoming more prone to exophthalmic goitre. My own figures, however, have not shown any such increased tendency in the male, but my patients, being mainly drawn from the hospital out-patient department, may not have shown the degenerative effects of civilisation to so marked a degree. Heredity seems to be a much less important factor in this variety than in the others. In Sir Hector Mackenzie's series[23] there was some family history in 10 per cent. of the cases. This is considerably less than that of the colloid goitres, where even in this country some 25 per cent. of the cases have one or more members of their families affected.

The age-distribution is somewhat similar to that of a colloid goitre, and like the sporadic cases of that disease it is rare to find the condition in young children. Sir Hector Mackenzie[23] in his series found there was one patient of 10 years of age, the others were all over 14. Attention has already been drawn to the fact that two distinct varieties of the disease may be recognised, and this is also seen in the age incidence. The vascular type is much more common in young people, and in my own series accounted for about half of the cases, their age of onset being between 15 and 25. The other or nervous group is commoner at a later age and is generally seen commencing between 35 and 45. It is of interest to note in Sir Hector Mackenzie's series[23] that in his hospital cases half of the patients were under 25, whereas in his private cases less than one quarter began before this age. It would seem, therefore, that the more well-to-do portion of the population are more prone to suffer from the nervous type. This may be due to the fact that such people are more subject to mental disturbance, which has long been noted to be a potent factor in the development of the disease. Very frequently one obtains a history that some severe mental stress, such as a shock or fright, or even prolonged mental worry, immediately preceded the onset of symptoms. During the late war a large number of cases of hyperthyroidism were seen in soldiers who had been exposed for a long period in the trenches, and in this country I have in my own series met with several cases who dated their disease back to a fright received during an air-raid. Sir Hector Mackenzie[23] found that in his series some serious mental disturbance was present in one-third of all the cases.

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* Lecture I. appeared in THE LANCET of July 14th, p. 53.

The relationship of an acute or chronic infection to this disease is not nearly so clearly established as in the case of colloid goitre. The researches and experimental work of Farrant[13] have, it is true, shown that after exposure to an acute infection or to an acute toxæmia changes occur in the thyroid gland which are identical with those seen with exophthalmic goitre. There is, however, as a rule, no clinical evidence of hyperthyroidism, and none of manifestations which are found associated with this disease. The relationships of intestinal infection cannot yet be regarded as proved, although McCarrison[21] believes that it is a very important factor. It is true that in many cases the symptoms date back to some acute infection such as influenza or rheumatic fever, but such a disease might act in much the same way as any mental disturbance rather than from the effects of the infection. Cases have been reported where the patient has been cured by methods directed to the improvement of intestinal stasis or the removal of some other source of infection such as may be found in the tonsils or teeth. Such cases are very few in number and it cannot yet be said that infection has been proved as a cause of the disease. McCarrison[21] has also laid stress upon the importance of malnutrition as a causative factor, but that such a condition is not an essential cause of the disease is shown by the fact that many cases occur in well-fed and otherwise healthy people, and there is no evidence at our disposal to show that the disease is more common among the poor.

Cause of Symptoms.

Much discussion has from time to time centred around the cause of the very diverse symptoms which occur with exophthalmic goitre. The older views that the disease was due to some lesion of the restiform bodies, which was based on the experiments of Filehne,[24] or of the sympathetic system, have little if any evidence to support them, and are now disregarded. The three views which are supported to-day are that the symptoms are due (1) to hyperthyroidism, (2) to dysthyroidism, (3) to pluriglandular disturbance. It will be manifest that whichever of these three theories is accepted, it will still leave unsolved the reason as to why there is a disturbance of the thyroid or of the other glands of the endocrine system. This change may still be caused by infection, by mental stress, or some other factor at present unknown. The belief that the symptoms are due to a pluriglandular upset has at first sight a considerable amount of evidence to support it. It is realised that in many cases of exophthalmic goitre and also of hypothyroidism there are changes in the pituitary gland and often evidence of interference with the activity of suprarenal glands. Moreover, the close relationship between the changes in this gland and periods of ovarian activity in the female will support this view. Strong evidence has also been brought forward to show that the thymus is as much or even more responsible for the symptoms as is the thyroid. Crotti and Bowen[9] as well as Capelle and Bayer[6] have strongly supported this view. All those who have had an opportunity of seeing post-mortem examinations upon examples of this disease will support Berry's statement[4] that in no such examination can one fail to notice an enlargement of the thymus. Bircher[5] states that he has been able to produce symptoms of the disease by grafting human thymus tissue into the peritoneal cavities of dogs. Garre[16] even advises operation upon the thymus gland as a cure for exophthalmic goitre. Such views have not, however, received general acceptance, and it is quite possible that the changes in the other glands of the endocrine system are secondary to those of the thyroid gland. The experimental and clinical evidence that the symptoms are due to a hyperthyroidism is so great that this view is generally accepted to-day, and it is upon its acceptance that the value of surgical treatment is based. The evidence may be summarised as follows: It has already been shown that Moebius,[25] Kocher,[18] and Berry[4] have demonstrated that there are always pathological changes to be found in the thyroid in Graves's disease, even when the gland is not clinically enlarged. A large number of experiments have been carried out upon animals. Edmunds[12] and Baruchi[3] were able to produce typical Graves's disease in a large series of monkeys, dogs, rats, and rabbits by administrating large doses of thyroid obtained from ordinary human goitre. These results have since been confirmed by French.[15] Considerable discussion has, however, arisen in the case of other experiments because it is difficult to determine accurately how far symptoms produced in animals are really analogous with Graves's disease in men. Klose, for instance, found that extracts of thyroid from cases of Graves's disease gave rise to different symptoms than extracts of normal thyroid when injected into animals, and Carlson[7] claimed that the symptoms which were produced were not those of exophthalmic goitre. Hence these observers and many clinicians to-day believe that the symptoms of exophthalmic goitre are due not so much to a hyperthyroidism as to a dysthyroidism. The more recent experience of de Quervain[10] would seem to show, however, that rats fed with the thyroid of exophthalmic goitre show the same hypersensitiveness to a deficiency of oxygen as when fed with the thyroid of an ordinary goitre, only to a much more marked degree. In addition to the experimental evidence there is a considerable amount of clinical observation which supports this view, and cases have been reported in which large doses of thyroid extract have been taken and have given rise to a typical picture of Graves's disease. Von Notthaft's well-known case[30] was one in which a man took excessive doses of thyroid extract as a cure for obesity and developed typical symptoms. Sir James Barr[2] reports others where symptoms followed excessive doses of tincture of iodine, and many cases, including those reported by Ball,[1] Kocher,[19] and Pineles,[28] have been recorded of hyperthyroidism following the use of thyroid extract in the treatment of simple enlargement of the thyroid. The pathological work of Wilson[37] and MacCarty,[22] who showed that the amount of cellular proliferation was in direct proportion to the extent of the hyperthyroidism, would support this same view. In the previous lecture stress has been laid upon the fact that adenomata of the fœtal type may give rise to symptoms of hyperthyroidism, and Dunhill[11] and Berry[4] described cases where similar symptoms have occurred in association with parenchymatous goitre. Any surgeon who has operated on a large number of thyroids will have met with cases where a typical exophthalmic goitre has become grafted upon a colloid goitre, and will have found that in these cases there is in addition to the colloid change a definite proliferation of the thyroid epithelium. Symptoms of a similar nature may occur with a carcinoma of the gland. A well-known example of this is the case reported by Clunet.[8] The good results which so often follow the operative removal of a portion of the enlarged gland lend very strong support to this view. It is true that many investigators, among whom may be mentioned Huber, have laid very special stress upon the fact that certain cases fail to be cured by operative treatment. That this is so will be endorsed by all surgeons of experience,

that such people are more subject to mental disturbance, which has long been noted to be a potent factor in the development of the disease. Very frequently one obtains a history that some severe mental stress, such as a shock or fright, or even prolonged mental worry, immediately preceded the onset of symptoms. During the late war a large number of cases of hyperthyroidism were seen in soldiers who had been exposed for a long period in the trenches, and in this country I have in my own series met with several cases who dated their disease back to a fright received during an air-raid. Sir Hector Mackenzie[23] found that in his series some serious mental disturbance was present in one-third of all the cases.

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That this is so will be endorsed by all surgeons of experience, but it must be remembered that the amount of gland which is removed at operation is very empirical, and it is often necessary to remove an amount which is insufficient to cause a cure simply because a larger operation would be fraught with considerable danger. In all large series such as those reported by Dunhill,[11] Kocher,[20] and Halsted,[17] and I may say also in my own series,[31] there have been examples in which the first operation has caused only an amelioration. Further operation has been necessary, but with the more extensive resection a complete cure has been obtained. It may be said, therefore, that the balance of evidence to-day strongly supports the view that the symptoms of exophthalmic goitre are due to a hyperthyroidism. It must be realised, however, that this is not a full explanation of the disease, for although there is a certain amount of evidence that this hyperthyroidism is itself dependent upon infection, our knowledge of the cause of the hyperactivity of the thyroid is at present incomplete, and although to-day operative removal may be the most satisfactory treatment, one is led to hope that in the future the cause of the excessive activity of the thyroid will be discovered and will be corrected so that operation will no longer be necessary.

SYMPTOMS.

The symptoms of this disease are manifold. The thyroid itself is generally enlarged, but the extent of the enlargement will vary very considerably. It is most in evidence in those cases which are secondary to a colloid goitre, and here, indeed, it may be the symptom of which patients chiefly complain. In the vascular type the thyroid is also considerably more enlarged than the nervous variety. Thus it is that as a general rule the younger the patient the larger the thyroid, and indeed in some of the more elderly cases the gland may be so slightly enlarged that it is not palpable. These cases are often described as Graves's disease with no goitre. The enlargement is as a rule uniform, although one lobe may be slightly bigger than the other. In a well-established case, especially in the vascular type, the anterior and external jugular veins are prominent and pulsate freely. The rapid beat of the carotid vessels is very manifest, and in some cases an actual expansile pulsation may be seen in the gland itself. Palpation of the upper poles will nearly always reveal a definite thrill, and in this position a murmur may be heard with a stethoscope.

There are usually very distinct ocular symptoms. The eyes are more prominent, the exophthalmos being seen quite early in the disease. There has been much discussion as to what is the actual cause of the prominence of the eyes, but the evidence to-day, as Murray[26] has shown, would seem to point to its being largely due to an increase of intra-orbital fat. Whatever is its origin, it is one of the last symptoms to disappear when the patient is cured. Associated with the exophthalmos are certain physical signs. Stellwag's sign is the presence of a visible ring of sclerotic around the cornea. Von Graefe's sign is the inability of the upper lid to follow the eye when it is directed downwards, so that if the patient looks down towards her feet there is a wider ring of visible sclerotic above the cornea. Moebius's sign is the inability of the eyes to converge in accommodating for near objects, and Joffroy's sign is the failure of the forehead to wrinkle when the patient looks up. Less commonly there may be weakness of the ocular muscles, so that there is slight dropping of both upper eyelids, and occasionally even paralysis of one or other external rectus, giving rise to double vision. It is important to remember that when the proptosis is extreme the patient may be unable to close the eyes, and under these circumstances the cornea may ulcerate, so that in many advanced cases there has been an extreme ulceration going on to sloughing of the cornea, with perforation and even complete destruction of the eye.

The circulatory symptoms are always a feature of the disease. The patient quite early in its progress will complain of palpitation and dyspnœa, which is always greatly increased on exertion or excitement. It will be found that the pulse is raised to 110 or 120 per minute even in mild cases. In the more severe periods of the disease it is often raised to 160 or sometimes, indeed, may be uncountable. Even at this period it will be noticed that the heart's apex beat is displaced outwards and is very forcible, so that it is diffused over a large area of the thorax. At first the sounds are clear in spite of the heart's rapidity, or there may be characteristic hæmic murmurs. Later on the cardiac muscle suffers, so that the pulse becomes irregular and there is evidence of auricular fibrillation. In several of my more advanced cases Dr. J. Parkinson found an advanced stage of this condition, a change which will only improve to a slight degree even when the hyperthyroidism is brought to an end.

The skin and its appendages also show very definite changes. These patients are prone to flush on the slightest exertion or excitement, and when first seen often show a characteristic appearance owing to the irregular and blotchy erythema of the face and neck. The sweat-glands are nearly always over-active, the constant moisture of the skin causing the patients considerable annoyance. They stand the heat badly and nearly always much prefer the winter months of the year. It is important to recognise the evil effects of heat, not only in causing an exacerbation of the disease, but because of the increased risks of operating during the hotter periods of the year.[31] Later on in the disease there are nearly always pigmentary changes, small irregular patches of dark-brown pigmentation appearing on the arms, chest, and abdomen. They are more marked in that frequently the patient shows a certain amount of general anæmia. The appendages of the skin are also affected. Nearly always these patients will complain of their hair falling out, and I have observed several cases in which there have been patches of alopecia appearing both before and after operation. In some cases this condition has progressed until very nearly complete alopecia has resulted. Dr. J. H. Sequeira has called special attention to this condition.

The above group of symptoms are most marked in that variety of the disease which I have described as the vascular type. These patients are usually relatively young. The condition has frequently started shortly after puberty. They show considerable enlargement of the thyroid gland, advanced exophthalmos, a rapid pulse, and very increased sweating. The other symptoms about to be described are also present, but, with the exception of amenorrhœa, are less in evidence.

Nervous symptoms are always present to some degree, and may indeed be the first indication of the onset of the disease. Some of these patients have first noted that they were startled and excited when spoken to, and at times indeed the first changes noticed may have been that they showed a tendency to drop articles when carrying out their household duties. They are always manifestly upset by the medical examination, and often have a difficulty in giving an account of their symptoms. This nervousness has been specially noticed in those cases of slight hyperthyroidism found in soldiers after long exposure to trench warfare, who later developed other evidence of hyperthyroidism. There are also well-marked physical changes on the nervous side. The patients show a fine rapid tremor in the extended hands. It affects, however, the whole limb and is present in the extended tongue. Sometimes it may be sufficiently marked to interfere with the patient's work. The threading of a needle and even drinking fluid from a full cup may be impossible. The tremor, like the other symptoms, is always increased when the patient is worried or excited. As further evidence of change in the nervous symptoms it may be noted that these patients often have bad dreams at night which are sometimes indeed sufficient to interfere considerably with their sleep. In the nervous type of the disease this group of symptoms is always the most in evidence. These patients may show such nervous irregular movements that they can barely sit still, and the condition comes to resemble closely the movements of chorea, although the more advanced age of the patient—she is usually between 35 and 40—will aid in the diagnosis. Mental changes are also more marked. In the minor degrees the patient is simply abnormally irritable, excitable, and emotional. These changes may be sufficient to interfere with her work, and she finds that they are more marked after a heavy day's work. It is often, indeed, on account of these symptoms that she has to abandon her business. Occasionally the condition may spread even further, and hallucinations may supervene. She then becomes melancholic or even maniacal, and attempts at suicide are not uncommon. In such conditions the patient will often complain of severe headache.

Gastro-intestinal changes are, as a rule, an indication of an exacerbation of the disease. There are periods often at the onset or perhaps arising irregularly at no definite time, and being dependent upon no known cause, when the patient will have severe attacks of vomiting and diarrhœa. At such a time the other symptoms will usually increase. As the exacerbation dies down the vomiting and diarrhœa will cease, and the patient will then develop a good appetite, which, however, at times may be capricious. It is in such periods that she loses considerable weight, and, in a severe case of the disease, wasting, passing on even to profound emaciation, is a constant factor. It has been noted that in some of these periods when the patient has shown diarrhœa and vomiting that there is glycosuria. The relationship of Graves's disease to diabetes has indeed often been noted, and it would seem that even when the hyperthyroidism has been relieved by operative treatment the patient is still prone to develop diabetes. In my series of 139 cases there were two who developed diabetes at periods of one and five years after operation. The relationship of these two diseases has been investigated by Williamson,[36] and he has shown that diabetes may follow the Graves's disease or rarely precede it, or that both diseases may develop together after some mental shock. He has also shown that not only is there often a mild temporary glycosuria in Graves's disease, but, as a rule, the sugar-tolerance is diminished. Occasionally there is a very definite family history of diabetes in patients suffering from Graves's disease.

Changes in menstruation are very common. A large proportion of my younger patients with the vascular type of the disease have had complete amenorrhœa, but this symptom is not constant, for in some of the more advanced conditions the periods have been quite regular and normal. It is usually stated that exophthalmic goitre has no effect either in preventing or altering the course of a pregnancy. This has not, however, been my experience. Some of my cases who have been married for several years and have been childless have become pregnant shortly after an operation. Moreover, it has been my general experience that if a pregnancy has occurred in unoperated cases the symptoms have always been considerably exaggerated, and I have therefore come to regard pregnancy as having a very deleterious effect upon the course of the disease. In those cases who have shown amenorrhœa the return of menstruation is often one of the earliest symptoms of improvement after an operation.

Changes in the blood have frequently been described as characteristic of the disease. As a general rule there is a slight amount of secondary anæmia. Kocher[11] has laid very great stress upon the presence of changes in the differential count of the white corpuscles, and states that there is nearly always an increase in the lymphocytes. Dr. Panton has, however, examined a large number of my cases and has not been able to determine that a change of this sort is in any way characteristic.

TREATMENT.

It is customary to-day to compare the results of medical and surgical treatment and to sum up in favour of one or the other. It must be remembered, however, that at no time has there been a closer coöperation between medicine and surgery, and in no disease is such coöperation so essential as in exophthalmic goitre. My aim, therefore, will be to indicate to you how the two methods should be combined and which variety of case should be treated with or without surgical measures. It is still perhaps necessary to point out that medical treatment alone cannot be considered satisfactory for the treatment of all cases. I think this is now becoming unanimously recognised. Sir Hector Mackenzie some 10 or 12 years ago pointed out that with medical treatment the mortality was somewhere in the region of 25 per cent., and that even in those cases which did not die medical treatment had to be carried out over a course of very many years. At that time, however, he did not advocate surgical intervention, as he regarded the mortality of operative treatment as much too high. In his more recent communication[24] his views have entirely changed, and he is now one of the strongest supporters of operative treatment. The evil results that may accrue in long-neglected cases I have already mentioned, and you are probably all familiar with examples of such. Grave myocardial changes, severe mental disturbances or injury, and destruction of the eye may all result, and once having arisen will usually be beyond recovery even if the hyperthyroidism is overcome. Since the view is usually accepted that the disease is due to hyperthyroidism the rational form of treatment would seem to be the removal of the excess of hypertrophied gland, but, as I have already pointed out to you, such a form of treatment must be regarded in itself as unsound. It is only a temporary measure which will be abandoned when the cause of the hyperthyroidism is known and can be overcome. The only serious objection to such a form of treatment to-day is that of the mortality of the operation. Only a few years ago this was extremely high, and there is no doubt that even to-day such an operation is one which has to be undertaken with the greatest care. It is always associated with considerable anxiety, for the causes of a temporary exacerbation of the hyperthyroidism are but little understood. More recent series of statistics show, however, that extremely satisfactory results can be obtained. In the discussion[24] at the Royal Society of Medicine in 1921 it was agreed that the present mortality averages some 5 per cent. In individual series which have been published the mortality has been reduced considerably below this. Romanis[29] published a consecutive series of 250 cases with only a 2·4 per cent. mortality. Pemberton[27] has published the latest group of cases from the Mayo Institute comprising in all 1093 cases. In this group the mortality was 1 per cent. One may say, therefore, that in this condition the danger is no greater than that associated with any other major operation. The difficulties arise in more advanced cases where severe secondary changes have taken place, and in hospital statistics a large number of such cases will have to be included, for although the risk may be well recognised, operation may be the only possibility of holding out any hope of amelioration or cure. It is the inclusion of a large number of such advanced cases which has kept the mortality of my own series at about 5 per cent., and I believe that if it fell much below this figure it would be an indication that I was refusing to offer help to many of those patients which stood most in need of it. It must be agreed, therefore, that surgery is not free from risk, but that it has a very definite place in the treatment of this condition, and we have to consider carefully what are the indications for its use. The points I would lay stress upon in operative treatment are:—

(*a*) *Selection of Time of Operation.*—It is my custom never to operate in the first six months of the disease.

I believe that in this period medical treatment holds out the greatest hope of success. In the early stages the symptoms are sometimes very acute and rapid in their progress. Not only will an operation in such a case be fraught with considerable risk, but the patient will generally react well to medical treatment. The details of such medical treatment it is not my place to discuss with you, but there is one method which must be mentioned as much attention has been directed to it of late. This method is that of X ray treatment. My own experience of its use has been very unsatisfactory. I have knowledge of three groups of cases in which it has been applied. There are firstly those who have come to me seeking further advice but have already had such a form of treatment. Manifestly these are selected cases of failure and therefore it would be unfair to judge the results of X ray treatment upon them alone. In my series of 139 cases there have been 14 such. They have all had prolonged courses of X rays and have gained little or no benefit. A large number of them indeed, as you will see from the photographs,* have been very seriously scarred and burnt from the application of the rays. Two stated definitely that their symptoms were much increased after treatment, one of them developed a squamous carcinoma of the skin which, although removed at the same time as the operation upon the thyroid, later recurred and led to the death of the patient. A second group are those who in the earlier series had been treated only with a hemithyroidectomy and who had had some recurrence of symptoms with enlargement of the remaining portion of the gland. Such conditions would seem to specially lend themselves to treatment by X rays, but of five which have been so treated there has been no relief in any example. Of the value of this form of treatment in the very early stages where an operation is not indicated my experience is naturally small, but I believe that, if combined with other methods, it may be of some value. I have no evidence that X rays can overcome hyperthyroidism even to the point of myxœdema, as is sometimes claimed; but, on the other hand, I have never found that it makes a future operation more difficult on account of the fibrosis. If I had evidence that it produced any fibrosis I should believe that it could control the hyperthyroidism. I have never seen it produce any change in the thyroid, but it may cause dangerous and unsightly changes in the skin. If at the end of six months the benefit has been very slight, or if the symptoms return as soon as the patient ceases medical treatment, then surgical intervention should be considered. Even if operation has been decided upon, an enormous improvement in the immediate results will be gained by a careful selection of the time of operation. It is well realised that all cases of exophthalmic goitre show periods of considerable exacerbation. Sometimes these are most marked in the first six months of the disease, but even later there is always a periodic variation. Mayo has stated that there has been nearly always a second relapse at the end of the first year which would usually last about six months, and that such a time was bad for operation. I have not found in my series that this change is at all constant but that every case is liable to bad attacks lasting for short periods which depend upon no known cause. The only safe method of treatment, therefore, is to carefully watch each case and to operate when the symptoms are minimal. It is well known that any sudden change of scene or excitement will lead to an exacerbation, and therefore no case must ever be operated upon immediately after the patient is admitted to hospital or nursing home. They should be carefully watched until it is realised from a study of the pulse and temperature, and often of the basal metabolic rate, that the patient is in the best possible condition for the operation to be undertaken. It is during this period that medical treatment is of so much value. In a large number of my more recent cases I have had the great benefit of Dr. C. H. Miller's help. He admits such cases and gives them a course of carefully thought-out medical treatment. If progress is marked operation is delayed, but if, as so often happens, the patient improves considerably and the condition then remains constant, the best time is selected and an operation is performed.

In the late stages of the disease, where there are secondary changes in heart and kidneys, an operation could only be performed with considerable risk, and the mortality is certainly high, but on the other hand, unless an operation be performed, progress will be steadily downhill and the disease itself is likely to be fatal. The increased dangers, therefore, are no counter-indication to operation, but the risk must be carefully explained to the patient's relatives. Although such patients are unlikely to be completely cured, they will often be so enormously improved that they will be converted from bedridden wrecks to those who are able to lead a useful happy life. In spite of all the above precautions there is still an element of uncertainty about this disease, and both Dunhill [11] and Berry [4] have had an experience which is similar to my own—namely, that every operation is carried out with a certain amount of anxiety, for even in those cases which appear to be most suitable an unlooked for result may occasionally occur. This indicates that there is still some factor of which our knowledge is at present imperfect. I[31] have recently laid stress upon the fact that during the very hot weather the symptoms are all exaggerated and the patient stands operation very badly, and that therefore during a heat wave the operation should be postponed.

(b) *Selection of the Type of Disease.*—I have already drawn attention to the different types of disease which may be met with, and the importance of recognising them lies chiefly in the fact that the mortality of operation differs considerably in each type. The colloid and nervous types are those who are likely to show the lowest operative mortality, but even with them the precautions mentioned above must be carefully observed. The nervous type of patient stands an operation badly, so that a rather more prolonged preliminary treatment may be necessary. Should there have been a history of mania or of attempts at suicide the outlook is even more serious, and for this reason many physicians and surgeons advise that the presence of such symptoms should be regarded as definite counter-indications to operation. It should certainly never be considered until medical treatment has been tried, but I have one case in my series who on three occasions had attempted suicide but after operation enormously improved and is now living a normal and happy life. An operation under such conditions must only be undertaken after the risks have been carefully considered and explained to the relatives.

(c) *Preparation for Operation.*—The importance of a thorough course of preliminary medical treatment has already been mentioned. It should under no circumstances be omitted. The administration of large saline injections as a means of lessening the toxæmia is of considerable value and may be very useful as a preparation for the anæsthetic. In the choice of anæsthetic there has been much discussion. Many surgeons lay great stress upon the importance of a local anæsthetic. It has been my custom, however, to use a minimum amount of ether, as I believe that if this anæsthetic is carefully given it is practically free from risk and it overcomes the drawback of the psychical disturbance which is often so evident in these patients when they are conscious. My own method is to administer for several days before the operation a rectal saline. On the day of operation the rectal saline is changed for a mixture of olive oil and ether, 3 oz. of each being used. This is administered about three-quarters of an hour before the operation and is usually sufficient to cause unconsciousness, so that the patient can be carried to the theatre without her knowledge. The actual anæsthetic is continued with ether on an open mask, but as a rule only about 1–1½ oz. is required. Chloroform in any form must never be used; it appears to act as a deadly poison.

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* Many photographs of cases before and after operation were shown at the lecture.

(*d*) *Choice of Operation.*—Many forms of operative technique have been carried out. In some advanced cases a preliminary ligature of the vessels of one or other pole—and my own belief is that ligature of the upper pole is a much simpler and less serious operation —is of value in reducing the toxæmia. If, however, a careful course of medical treatment has been carried out this preliminary operation will be required very seldom. There is no doubt that at the operation itself the two chief dangers are dependent upon pressure upon the gland and upon hæmorrhage. Owing to these dangers the operation must be slowly and carefully performed. Every vessel should be carefully ligatured before it is divided, and any attempt at a wedge-resection should be abandoned. It will generally necessitate considerable pressure upon the gland, a much more severe hæmorrhage and rather rougher handling in order to control the bleeding.

(*e*) *Operative Technique.*—Free access to the gland is obtained by means of a collar incision, and for the same reason the pretracheal muscles should preferably be divided. The individual vessels are isolated in turn and divided between ligatures. The number of vessels to be tied and the amount of thyroid to be removed will of necessity vary with the severity of the case, and if the symptoms are very marked it may be necessary to be content with a small resection, and later, when the patient has improved, to carry out a further operation. My aim in suitable cases is to ligature and divide the superior vessels, the middle and inferior thyroid vein in the right side; to ligature and divide the left inferior thyroid vein, and to ligature the left superior thyroid vessels. These steps are accomplished in turn; the right lobe is then turned inwards, and the inferior thyroid artery ligatured in continuity as it lies on the longus colli muscle. The right lobe, except for a small slice on its posterior surface, is then removed together with the isthmus and the inferior and the internal portions of the left lobe. There is thus left the upper and middle portion of the left lobe, the superior vessels of which have been tied, and which is, therefore, supplied by the inferior thyroid artery and drained by the middle thyroid vein. After all bleeding has been controlled a tube is inserted and the pretracheal muscles are closed. The skin is sutured with silkworm gut.

(*f*) *After-treatment.*—After every operation upon the thyroid gland there will be a period of reaction, probably due to hyperthyroidism, and in this period danger arises. In fatal cases the patient will get more and more restless, the temperature and pulse will rapidly rise, sweating will be increased, and there will often be a condition of slight mania. In satisfactory cases the temperature may rise to 102° and the pulse to 140 or 160. As long as there is any such evidence of reaction the tube should be kept in place. Morphia should be given freely to overcome restlessness, and large quantities of fluid administered both by mouth and per rectum. The patient should be kept in bed for at least three weeks after operation, and after leaving hospital should be given strict rules as regards her life and diet. All form of excitement and stimulants should be avoided. The patient should live as much as possible in the fresh air, and a plain, simple diet with a relatively small amount of meat should be advocated.

Post-Operative Results.

It has been mentioned that in my own series the mortality has been 5 per cent. This probably could have been reduced, for in some of the earlier cases the operation was performed at what is now realised to be an unsuitable time. Until, however, these cases come up for treatment earlier in their disease, and until operation is sought before there are advanced secondary changes, there will still be an appreciable mortality. Of the cases that survived operation five have died later; one of these was from the recurrence of X ray carcinoma, two had developed diabetes, and two had succumbed with cardiac symptoms due to hyperthyroidism. Of the remaining 129 cases, 78 per cent. have been changed from disabled wrecks into people who are capable of living normal lives and of earning their living. In these, it is true, some still show exophthalmos, and have a pulse-rate which is likely to be increased upon excitement and exertion, but they are nevertheless able to live normal and happy lives. It must be remembered, too, that exophthalmos, although it will ultimately disappear entirely, may persist for a very long period, even when all other symptoms have disappeared. It should also be explained to the patients that after such an operation there is no immediate cure such as occurs with so many other surgical lesions, and the following stages can be recognised in every case:—

(1) *Stage of Reaction.*—This lasts for three to four days after operation, and the symptoms are those of hyperthyroidism.

(2) *Primary Improvement.*—When the patient leaves hospital it is often found that the pulse has fallen to normal, that the tremor has almost disappeared, and that there has been a remarkable and startling improvement. It will persist, as a rule, for two to three weeks.

(3) *Stage of Relapse.*—Whatever rules are given to the patients, it will usually be found that after they have returned home there is a certain return of their symptoms, and unless this relapse is appreciated it will be found to cause considerable disappointment. As a general rule it would last for only two to four months, but if the case is less satisfactory, or if insufficient thyroid have been removed, it may be prolonged very considerably, and, in fact, until a further portion of the enlarged thyroid is removed.

(4) *The Stage of Apparent Cure.*—It is only when cases have been watched very carefully for a prolonged period that it is realised that after operation they will show a complete freedom from all symptoms, but should there be any severe mental upset or disturbance the symptoms may recur. I have had experience of several such cases, apparently absolutely cured, who having been subjected to the disturbance and fear of an air raid, have had their symptoms return to a minor degree. As a general rule a short course of medical treatment was sufficient to overcome these symptoms. This period of instability would appear to last for some two to four years.

(5) *Stage of Complete Cure.*—This is the condition in which the patient is not only completely free from all symptoms, but can apparently be subjected to all normal shocks and disturbance without fear of recurrence.

There is a general fear, since some cases show a regression of the changes in the thyroid when under medical treatment, that similar changes might occur after operation, and since a relatively small portion of thyroid is left therefore myxœdema would result. I have no experience of any such complication. In my own series of true exophthalmic goitre there has never been any myxœdema after operation. Kocher[18] has had a similar experience, and it would seem that of the few cases reported the myxœdema appeared very shortly after operation, and was due to removal of too large a portion of the gland. I believe, therefore, that this danger is greatly exaggerated.

It will be evident to you that in the treatment of a very large number of the different forms of goitre I have advocated the use of medical measures. I feel, however, that no apology is needed for discussing a subject which is so largely medical, for the first lesson that you as surgeons have to learn is what cases should be so treated. If I have been able to indicate to you when not to operate as well as when to operate in lesions of the thyroid gland, I shall feel that I have not taken up your time in vain.

(*Continued at foot of next page.*)

THE ÆTIOLOGY OF KALA-AZAR AND TROPICAL SORE.

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THE theory which associated kala-azar with the bed bug, and which promised well in the initial experiments carried out by Patton[1] does not, up to the present, appear to have yielded definite results; the position with regard to other insect vectors incriminated in this disease and in tropical sore is also unsatisfactory. The fact that the common bed bug has a very wide distribution has been adduced with reason against the theory that it would prove to be the vector of a disease of such circumscribed distribution as kala-azar. In investigating these diseases, attention has been given to the flagellates which commonly infest various plant bugs, but these have been exonerated on account of the fact that the bugs do not bite man. An observation which I recently made in Sierra Leone may possibly serve to focus attention again on plant-feeding bugs.

Since Lafont's[2] discovery of the occurrence of flagellates of the genus Herpetomonas in plant juices—the latex of Euphorbia—more attention has been given to the flagellates which infect plant bugs, as well as to the natural flagellates of other insects. Laveran and Franchini[3] recorded their success in producing Leishmania forms of parasite in mice by injecting them with flagellates from insects; Fantham and Porter[4] and other observers have repeated and confirmed their experiments. Recently Roubaud and Franchini[5] obtained in mice infection with Leishmania forms of parasite by allowing fleas having a natural infection to breed in their box. The infection, which proves fatal to the mice, was conveyed to fresh mice by means of subcutaneous injection of ground-up tissues. These workers also obtained a similar result in mice by injecting into them the fæces of fleas.

Flagellate Infection among Plant Bugs.

The occurrence among plant bugs of flagellate infection has been emphasised by Patton[6], who described *Herpetomonas lygæi* and other such bug flagellates. Evidence is also available of the ability of the flagellates to infect the bugs, not only in the alimentary canal, but also in the salivary glands. Franchini[7] reports that he has cultivated flagellates *Herpetomonas pyrrhocoridis* from the alimentary canal and salivary glands of *Pyrrhocoris apterus*. Miss Robertson,[8] in Uganda, found the alimentary canal of the red cotton bug infected; she also found that another species of bug, *Leptoglossus membranaceus*, was commonly infected with Herpetomonas in the salivary glands. She refers with emphasis to "the independent development in a sucking insect of all the factors requisite for the transmission of a flagellate, parasitic in the intestine, by way of the mouth parts of the insect host."

Experiments of great interest were carried out by Franchini[9] in cultivating in media containing plant juice various natural flagellates of insects. He showed not only that such flagellates will develop readily in certain of these media, but also—what is of especial interest—that the parasite of tropical sore will grow in a medium containing certain plant juices. There is thus established a connexion biologically between a human parasite and the insect flagellate and plant juice, which I venture to think is not without significance. If we find that bugs, which as a rule live on plant juice and which are capable of harbouring flagellates in their gut and in their salivary glands, are able to bite man, it would be a strong argument for the thorough investigation of the habits and bionomics of such forms before their dismissal from consideration in connexion with kala-azar and tropical sore.

Do Plant Bugs Bite Man?

I desire here to draw attention to the fact that a cotton stainer, which is apparently restricted very closely to certain species of food plant, is capable of biting man. The species* of bug is *Dysdercus superstitiosus*, which at first, as the result of several experiments made by me in the laboratory, I concluded could not bite man. This year at Freetown I was bitten by this bug on the ankle on two occasions, April 24th and 26th, while sitting out of doors at dusk, and after many attempts was successful in getting one to bite experimentally. On each occasion there was a local reaction in the form of an irritating swelling, and on the third occasion this was followed by extensive swelling of the leg, with considerable œdema and great itching. There was no general reaction, no rise of temperature, no enlarged glands; no parasites were found in the blood, but there was great eosinophilia. This species of bug has been observed by me to feed in nature on the carcass of a dead frog. A near ally, *D. fasciatus*, has been recorded by Mansfield Aders[10] as feeding with avidity on fresh mammalian carcasses, skins, and skulls. Lamborn[11] says that during the dry season *D. superstitiosus* appeared to thrive on almost any

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* Mr. Lang, of the British Museum, kindly identified the species for me.

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food of animal or vegetable origin, for eight or ten were noticed feeding on a dead and sun-dried lizard, and a batch of young nymphs were found on sheep's excreta. Peacock[12] gives an observation of young stainers of the same species feeding on a dead snail. The habits as regards food plants of these bugs confine them chiefly to cotton, the silk cotton tree, okra, and other Malvaceæ. While the obvious adaptability of such bugs makes it appear possible that in some districts they have acquired even greater readiness in biting man in nature, there is also the fact that they are in most cases very restricted either to certain areas or to certain food plants. On dissection of specimens of *Dysdercus superstitiosus*, I found that they were heavily infected in various portions of the alimentary canal with a Herpetomonas; this was also found in one case in cœlomic fluid.

I believe these observations to be worthy of record, although owing to their having taken place only a few days before my leaving Freetown, they are necessarily far from complete. In view of the present state of the kala-azar problem, I consider that they indicate the necessity of an investigation of all such forms, not only in countries where kala-azar abounds, but also in countries where tropical sore occurs.

NOTE.—In a letter received, since this article was written, from Dr. Maplestone at Freetown, he informs me that he has discovered infection of the salivary glands.

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KÖHLER'S DISEASE OF THE TARSAL SCAPHOID.

By H. H. GREENWOOD, B.S.Lond., F.R.C.S.Eng.,
CONSULTING SURGEON, G.W.R. HOSPITAL; HONORARY SURGEON, VICTORIA HOSPITAL, SWINDON.

SINCE Köhler showed his first three cases of this disease at Wiesbaden in 1908 and published an account of them,[1] the number of examples placed on record is inconsiderable. In 1915, when he reviewed the subject, there were only 26; since that time additional cases have been described by Maynard Heath,[2] O'Brien,[3] Hetzel,[4] Moreau,[5] Roederer,[6] Beltrandi,[7] but the disease must still be considered to be comparatively rare. The symptoms and physical signs are not obtrusive, spontaneous recovery seems to be the rule, and the precise diagnosis rests on the characteristic X ray appearances; it is probable, therefore, that the disease often escapes detection and that it is more common than the records indicate. The clinical picture is fairly clear-cut, although in details there are some differences of opinion.

Clinical Picture.

The disease occurs in young children, more frequently in boys, between the ages of 3 and 10 years. The onset is usually insidious, sometimes sudden,[8] with pain and swelling in the region of the tarsal scaphoid. Whilst it is generally unilateral, both feet are sometimes affected. The general health is usually indifferently good. The child develops a limp and shows more or less tendency to flat-foot. Spontaneous recovery always occurs, so far as present records show, in from 6 to 12 months from the date of diagnosis. The ultimate diagnosis rests on the X ray findings. On these, but not on their general interpretation, there seems to be general agreement. They are as follows.

(1) The affected bone is smaller than normal (half to quarter size); (2) the outline of the bone is irregular (Köhler omits to mention this fact); (3) the density of the bone is increased (estimated at two to four times); (4) the normal architecture of the bony trabeculæ has disappeared. To these may be added (5) the general shape of the scaphoid is altered, being more flattened from before back and not widened from side to side.

Ætiology.

When we consider the ætiology we find considerable diversity of opinion; the attempt to find analogues in Madelung's deformity of the wrist-joint, in Perthes's disease, in Schlätter's disease of the tibial tubercle, would be more helpful if the ætiology of these affections were less speculative. Kidner's report of a case of Perthes's disease, in which at an operation "a *Staphylococcus aureus* from a blood-stream infection" was found, is suggestive, but lacks confirmation. All authorities exclude rickets and syphilis as causative factors; most writers reject tuberculosis on grounds that appear inconclusive. Abrahamsen[9] strengthens the view that the disease is a simple "dystrophy" by citing the case of a boy aged 7 years, who without any (known) antecedent injury developed weakness of the right ankle. A skiagram showed that there was little or no sign of ossification present in the right scaphoid, although this process normally begins in the fourth year. In the left foot ossification was normal. After nearly three months' administration of thyroid extract a skiagram revealed typical Köhler's disease of the right tarsal scaphoid with a narrow, compressed, and dense centre of ossification.

Köhler himself shares this view, which receives confirmation from the fact that the disease may be bilateral (Köhler, 10 cases out of 26) and unassociated with any history of trauma. He also found a similar condition in the patella of the same side in one case. Rotch[10] found the twin brother of one case with similar X ray evidence in the scaphoid, but with no symptoms. The argument that the disease is a dystrophy is materially weakened, however, by Köhler's assertion that relapse sometimes occurs. Incidentally, his estimate of the duration of the disease at 2–3 years is shown by later observers to be too prolonged—in Maynard Heath's case,[11] as in mine, the bone had returned to an almost normal appearance in six months. Stümme[12] ascribes the disease to a compression fracture, and Preiser[13] supports his view by comparing it to a fracture of the carpal scaphoid. O'Brien[14] invokes a delay in ossification, stimulated by trauma to osteogenesis. Schultze[15] obtained a definite history of injury in six out of seven cases. Pfahler[16] dismisses injury on the ground of there being in many cases no history of such a cause and of the onset being often gradual. The latter assertion is generally conceded, and any injury is often so trivial that none can be recalled, but gradual onset and trivial injury as a provocative cause of tuberculous disease in the subject of a latent infection suggest more serious consideration of the view of Fassett,[17] who, so long ago as 1914, advanced the explanation that the lesion is a healed and sclerosed tuberculous infection.

The Question of Tuberculosis.

Although most authorities demur on account of the clinical course of the disease, and Hetzel[18] found the von Pirquet reaction negative, the new evidence I shall detail warrants a review of the clinical data and X ray appearances, none of which is incompatible with this theory. Dogmatic statements only serve to darken the night of our doubts, and should not be allowed to carry conviction.

Roederer,[19] reviewing the subject in 1920, asserts confidently that "les deux sexes sont indifférement atteints." (Maynard Heath declares that the condition is *always* found in *boys* between 3 and 9 years.) Again, he says, "*aucun de ces enfants n'est tuberculeux.*" And later he states "deux fois seulement l'enfant appartient à une famille tuberculeuse (Köhler 1, Schultze 1)." As to the positive grounds upon which the assertion that all the patients were free from tuberculosis is based, there is no evidence. Parental

food of animal or vegetable origin, for eight or ten were noticed feeding on a dead and sun-dried lizard, and a batch of young nymphs were found on sheep's excreta. Peacock[12] gives an observation of young stainers of the same species feeding on a dead snail. The habits as regards food plants of these bugs confine them chiefly to cotton, the silk cotton tree, okra, and other Malvaceæ. While the obvious adaptability of such bugs makes it appear possible that in some districts they have acquired even greater readiness in biting man in nature, there is also the fact that they are in most cases very restricted either to certain areas or to certain food plants. On dissection of specimens of *Dysdercus superstitiosus*, I found that they were heavily infected in various portions of the alimentary canal with a Herpetomonas; this was also found in one case in cœlomic fluid.

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(1) The affected bone is smaller than normal (half to quarter size); (2) the outline of the bone is irregular (Köhler omits to mention this fact); (3) the density of the bone is increased (estimated at two to four times); (4) the normal architecture of the bony trabeculæ has disappeared. To these may be added (5) the general shape of the scaphoid is altered, being more flattened from before back and not widened from side to side.

Ætiology.

When we consider the ætiology we find considerable diversity of opinion; the attempt to find analogues in Madelung's deformity of the wrist-joint, in Perthes's disease, in Schlätter's disease of the tibial tubercle, would be more helpful if the ætiology of these affections were less speculative. Kidner's report of a case of Perthes's disease, in which at an operation "a *Staphylococcus aureus* from a blood-stream infection" was found, is suggestive, but lacks confirmation. All authorities exclude rickets and syphilis as causative factors; most writers reject tuberculosis on grounds that appear inconclusive. Abrahamsen[9] strengthens the view that the disease is a simple "dystrophy" by citing the case of a boy aged 7 years, who without any (known) antecedent injury developed weakness of the right ankle. A skiagram showed that there was little or no sign of ossification present in the right scaphoid, although this process normally begins in the fourth year. In the left foot ossification was normal. After nearly three months' administration of thyroid extract a skiagram revealed typical Köhler's disease of the right tarsal scaphoid with a narrow, compressed, and dense centre of ossification.

Köhler himself shares this view, which receives confirmation from the fact that the disease may be bilateral (Köhler, 10 cases out of 26) and unassociated with any history of trauma. He also found a similar condition in the patella of the same side in one case. Rotch[10] found the twin brother of one case with similar X ray evidence in the scaphoid, but with no symptoms. The argument that the disease is a dystrophy is materially weakened, however, by Köhler's assertion that relapse sometimes occurs. Incidentally, his estimate of the duration of the disease at 2–3 years is shown by later observers to be too prolonged—in Maynard Heath's case,[11] as in mine, the bone had returned to an almost normal appearance in six months. Stümme[12] ascribes the disease to a compression fracture, and Preiser[13] supports his view by comparing it to a fracture of the carpal scaphoid. O'Brien[14] invokes a delay in ossification, stimulated by trauma to osteogenesis. Schultze[15] obtained a definite history of injury in six out of seven cases. Pfahler[16] dismisses injury on the ground of there being in many cases no history of such a cause and of the onset being often gradual. The latter assertion is generally conceded, and any injury is often so trivial that none can be recalled, but gradual onset and trivial injury as a provocative cause of tuberculous disease in the subject of a latent infection suggest more serious consideration of the view of Fassett,[17] who, so long ago as 1914, advanced the explanation that the lesion is a healed and sclerosed tuberculous infection.

The Question of Tuberculosis.

Although most authorities demur on account of the clinical course of the disease, and Hetzel[18] found the von Pirquet reaction negative, the new evidence I shall detail warrants a review of the clinical data and X ray appearances, none of which is incompatible with this theory. Dogmatic statements only serve to darken the night of our doubts, and should not be allowed to carry conviction.

Roederer,[19] reviewing the subject in 1920, asserts confidently that "les deux sexes sont indifférement atteints." (Maynard Heath declares that the condition is *always* found in *boys* between 3 and 9 years.) Again, he says, "aucun de ces enfants n'est tuberculeux." And later he states "deux fois seulement l'enfant appartient à une famille tuberculeuse (Köhler 1, Schultze 1)." As to the positive grounds upon which the assertion that all the patients were free from tuberculosis is based, there is no evidence. Parental

2. Septic infection of tears, chiefly of the vagina, due to laceration by sharp pieces of the broken-up fœtal skull. 3. Fistulæ—vesico-vaginal or recto-vaginal—probably from injury with subsequent ulceration through to bladder or rectum, rather than from direct laceration right through to one or other cavity at the time of extraction.

CÆSAREAN SECTION.

The cases of Cæsarean section, as would be expected, have increased in numbers as the years have gone by, the greatest number being recorded in 1922. It is to be expected that the yearly number of these cases will increase, within limits, for some time to come, mainly because of increasing antenatal care and anticipation of troublesome complications. On the other hand, it is quite reasonable to suggest that cases of Cæsarean section may be limited in number by induction of premature labour in selected cases. But Munro Kerr would seem not to agree with such a statement, for he says: "Induction of labour does not come into competition with Cæsarean section, for very rarely are the results from induction satisfactory if the conjugata vera is under 3¼ inches."

One might say that in the mother's interests, in cases of contracted pelvis of varying degree, and if forceps are not likely to avail, induction is the procedure of choice, Cæsarean section the best thing to do if induction is contra-indicated, and craniotomy an unfortunate necessity, as applied to the living child, when other and better means are not available. In a few cases symphysiotomy or pubiotomy may be considered. Nevertheless, much may be done by giving plenty of time during labour, combined with Walcher's position in cases of mildly contracted pelvis, taking for granted that presentation and position are normal. It is well in those slow cases to employ twilight sleep.

Cæsarean section, being a comparatively easy and somewhat spectacular operation, is apt to be abused and employed unnecessarily.

Of the patients in this series—representing 57 operations—30 were primiparæ and 27 were multiparæ. The patients actually numbered 50, as two were operated on three times and three were operated on twice. In addition, one patient had her second Cæsarean section performed in the Dundee Royal Infirmary, the first having been done in America.

Cæsarean section is not without its dangers to the mothers, and certain morbid sequelæ, or even death, may result. This must be taken into account in deciding between this and some other procedure. Also there is quite a definite fœtal mortality, so that in a few instances the objective may be at least partly lost on this account. A few cases may be recorded by way of indicating the worth of the operation when properly applied:—

CASE 1.—First child, premature, died in 29 hours; second child, symphysiotomy, died; third child, Cæsarean section, alive and mature.

CASE 2.—Three children, craniotomy each time; fourth child, Cæsarean section, alive and mature.

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The indications in the present series (totalling 57) were:—

Contracted pelvis	51
Contracted pelvis and malposition ..	1
Carcinoma of rectum	1
Placenta prævia	2
Reason not stated	2

As the operation results have improved, so have the indications increased, but discrimination and forbearance are required lest it be undertaken rashly and without necessity. For there are not only immediate dangers, but late ones, such as rupture of the uterine scar at a subsequent pregnancy.

Indications.

1. *Contracted pelvis.*—This is the commonest indication. This may be actual or relative, for a postmature child passing through a normal pelvis will create the same problem as an ordinarily mature child passing through a narrow pelvis. Pelvic measurements taken in advance are of great value, but, as it is said, the best pelvimeter is the fœtal head. The relationship can usually be fairly accurately estimated by abdominal or bimanual palpation. Thus a decision may be come to either for or against the operation in any given case. Roughly speaking, a conjugata vera of 3¼ inches or less is likely to lead one to consider the advisability of performing Cæsarean section, unless the child is very small.

If the child be dead, craniotomy would be the operation of choice, unless the pelvic contraction or deformity is too great for that to be justified.

2. *Tumours.*—These are chiefly fibroids and ovarian tumours. As pregnancy advances, or in the early stages of labour, the tumour may rise out of the pelvis and thus cease to be a cause of obstruction. If it remains in the pelvis Cæsarean section is indicated, for it is dangerous to both mother and child to try to drag the child past the obstruction. A thin-walled cyst might rupture during the process and thus remove the trouble. Under proper circumstances it may be deemed wise to remove a tumour, when recognised, during pregnancy, deliberately running the risk of inducing premature labour by such interference. More often it would be indicated to do a Cæsarean section at term and deal with the tumour at the same time. Other tumours need not be specified.

3. *Eclampsia.*—The indication for Cæsarean section in this condition is not very great. The child is often dead in any case, and the results to the mother do not greatly encourage recourse to this method of treatment. Success might possibly be more frequently ascribed to Cæsarean section if it were carried out in the early stages of the eclampsia. At the British Congress of Obstetrics and Gynæcology held in Liverpool in June, 1922, Cæsarean section did not take a very high place in the treatment of eclampsia. The cases were divided into mild (M.) and severe (S.).

Maternal mortality.	London.		Midland.		Aggregate.	
	M.	S.	M.	S.	M.	S.
(*a*) Natural delivery ..	6·0	20·5	3·6	44·0	4·5	36·9
(*b*) Assisted delivery ..	5·0	33·3	8·0	29·4	5·5	31·7
(*c*) Induction	5·1	20·8	11·7	40·0	6·6	26·4
(*d*) Cæsarean section ..	9·8	43·2	50·0	75·0	11·3	46·3
(*e*) Accouchement forcé ..	25·0	60·0	14·3	66·0	18·1	63·1

Cæsarean section may be required in cases of eclampsia for some other reason, quite apart from the eclampsia itself—e.g., contracted pelvis.

4. *Placenta Prævia.*—Lawson Tait recommended Cæsarean section for this condition in 1898. In selected cases this may be the operation of choice, under suitable conditions, as one would not expect the maternal death-rate to be raised, and certainly the fœtal death-rate should be lowered very considerably. But one would deem it wise to operate very early in labour, or just before its onset, before the placental circulation has become seriously embarrassed or cut off, and before much vaginal examining has been done, involving the greater risk of sepsis. It would seem unwise to advocate the operation in merely marginal cases and also in cases in which there has been so much bleeding with, presumably, wide separation of the placenta, that the child must almost certainly be dead.

5. *Accidental Hæmorrhage.*—Cæsarean section would rarely if ever be done for this complication in mild cases, and in severe cases the child would usually be dead. Hence the indication would be to save the mother, if it is considered that bleeding is still going on to a dangerous extent, and if she cannot be delivered quickly enough in the normal way, or if it is considered that she might stand Cæsarean section

the battle had really been won, and which had become, five months after the first observation, a typical case of ordinary Köhler's disease. In every case hitherto recorded the pathology has been deduced from probabilities. This appears to be the first instance of a definite linking-up of the condition with a known disease.

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SYMPHYSIOTOMY, CRANIOTOMY, AND CÆSAREAN SECTION.*

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ASSISTANT GYNÆCOLOGIST AND OBSTETRICIAN, ROYAL INFIRMARY, DUNDEE.

A STUDY of the case records in the Dundee Royal Infirmary Maternity Department from 1901 to the end of 1922 has brought various points of interest into view.

SYMPHYSIOTOMY.

During the period 1901 to 1922 symphysiotomy was performed 12 times. The usual indication was contracted pelvis. It may be taken for granted that no one would have recourse to this operation without first having given forceps a fair trial, not to mention Walcher's position, at least in many cases. In one case in this series a brow presentation was given as the indication. Obviously symphysiotomy is of no avail except in mild degrees of disparity between fœtal head and pelvic brim.

The increase in measurement available with an interval between the pubic bones of 6 cm. ($2\frac{2}{5}$ in.) is not very great at the brim, but is of considerably more value, according to Munro Kerr, at the outlet between the ischial tuberosities. The estimated increase at the brim with a separation of 6 cm. is as follows: Antero-posterior diameter, 1 cm. ($\frac{2}{5}$ in.); oblique diameter, 1·5 cm. ($\frac{3}{5}$ in.); transverse diameter, 2 cm. ($\frac{4}{5}$ in.).

Dangers of Symphysiotomy.

The operation is not to be undertaken lightly, for it has its dangers. There is quite a definite maternal death-rate and, apart from loss of life, there are various morbid conditions which may affect the mother. The chief danger is sepsis, and this may go so far as to cause sloughing of part at least of the vaginal wall. Cystitis may also develop, and one must not forget the possibility of injury to the sacro-iliac joints. There is also a fœtal mortality associated with this procedure. It is possible that this might be somewhat reduced if the need for symphysiotomy were recognised sufficiently early, for, no doubt, too strenuous efforts to extract the child with forceps may in many cases turn the scale in the wrong direction and lead to the death of the child.

Symphysiotomy is an operation of limited value and should only be performed under good conditions and if proper after-care is available.

CRANIOTOMY.

With increased antenatal care one would have expected a distinct drop in the number of craniotomy cases, but in the period specified the largest number was done in 1921. It is important that antenatal care should extend to all private patients as well as to hospital ones. If the private case develops into an emergency (in the private house), the chance of a happy issue is less than in the case of a hospital patient unless, as is only occasionally the case, the patient can be removed to a nursing home. As a rule, by the time the emergency has arisen, it would be inadvisable to remove the patient. So the best thing must be done under inconvenient circumstances, and that may mean craniotomy.

In every private and hospital case the ideal is that the pelvic measurements should be known well beforehand, as also the position and presentation of the child, the relation in size of the presenting part to the pelvic brim, and the state of the urine. If this were done as a routine, and if preventive measures were carried out, there would be fewer bad results to both mother and child. Craniotomy is, at best, a revolting operation, especially if carried out on the living child. Any operation involving a death-rate of 100 per cent. to the child cannot be an ideal and can only be recommended as the best thing to do under bad circumstances.

At the end of 1922 there was a leading article in THE LANCET on Justifiable Fœticide,[1] which was commented on by (presumably) a Roman Catholic doctor[2]; what the latter said is worth recording, for no doubt most medical men are aware that the destruction of the living child in utero is strictly against the dictates of the Roman Catholic Church. I quote from the doctor's letter: "The teaching of the Church with regard to craniotomy is quite clear and definite, it is not permissible under any circumstances." Then there is the order given in Latin. He goes on: "This decision was given at Rome, August 19th, 1888, and repeated with the papal approbation on July 24th, 1895."

That is all very well, and I do not wish to start a controversial argument here on this decision. But what I wish to point out is that apparently the authorities of the Roman Catholic Church do not recognise that in allowing the mother to die by neglect of a craniotomy they are still not saving the child, for a dead mother, in these circumstances, would mean a dead unborn child. There would thus be the certainty of two deaths as against one. Although most of us, no doubt, do not agree with a strict order against craniotomy on the living child, yet we must all be at one in holding that such a procedure should be avoided if it is at all possible and consonant with the safety of the mother.

There are substitutes—namely, induction of labour and Cæsarean section, not to mention symphysiotomy or pubiotomy—under certain circumstances. Proper antenatal care will give the best chance for calling these substitutes into play. Of the cases of craniotomy in this series by far the commonest indication was contracted pelvis. There were three cases in which hydrocephalus was the indication, and in a few cases the operation was performed for various other conditions. In three of the cases the after-coming head was perforated. From a study of the case-sheets it would appear that nearly all, if not actually all, of the children were already dead before craniotomy was done, forceps having been found to be ineffectual.

This series shows that there is a real danger of death or of morbidity to the mothers. With much interference there is a particular liability to septic invasion and the patient, too, may become worn out and collapsed. In two cases rupture of the uterus is reported.

Perhaps the three chief morbid results, apart from death, which may follow craniotomy are: 1. Sepsis, from much interference, involving the uterine cavity.

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* Based on a paper read before the Forfarshire Medical Association, in which the actual statistics were given.

[1] THE LANCET, 1922, ii., 1182.

[2] Ibid., 1353.

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Cæsarean Section.

The cases of Cæsarean section, as would be expected, have increased in numbers as the years have gone by, the greatest number being recorded in 1922. It is to be expected that the yearly number of these cases will increase, within limits, for some time to come, mainly because of increasing antenatal care and anticipation of troublesome complications. On the other hand, it is quite reasonable to suggest that cases of Cæsarean section may be limited in number by induction of premature labour in selected cases. But Munro Kerr would seem not to agree with such a statement, for he says: "Induction of labour does not come into competition with Cæsarean section, for very rarely are the results from induction satisfactory if the conjugata vera is under 3¼ inches."

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As the operation results have improved, so have the indications increased, but discrimination and forbearance are required lest it be undertaken rashly and without necessity. For there are not only immediate dangers, but late ones, such as rupture of the uterine scar at a subsequent pregnancy.

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Cæsarean section may be required in cases of eclampsia for some other reason, quite apart from the eclampsia itself—e.g., contracted pelvis.

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5. *Accidental Hæmorrhage.*—Cæsarean section would rarely if ever be done for this complication in mild cases, and in severe cases the child would usually be dead. Hence the indication would be to save the mother, if it is considered that bleeding is still going on to a dangerous extent, and if she cannot be delivered quickly enough in the normal way, or if it is considered that she might stand Cæsarean section

but would very likely succumb to the prolonged strain of labour.

Other Indications.—Other possible indications, which may be briefly dismissed, are as follows:—

(*a*) A uterus which has had one or other fixation operation performed on it which will limit its power of expansion in the proper form and is thus in danger of rupturing or of becoming impacted.

(*b*) The operation might be justifiable in a very few cases of prolapse of the cord if the child were still actively alive and if the cord could not be retained in the uterus.

(*c*) It might be done occasionally in certain cases of malpresentation or malformation of the fœtus, and in certain cases of abnormality of the maternal passages—e.g., retraction ring, rigid os, bone tumour, and so forth.

(*d*) Some diseases might also be considered as indications for the operation, such as certain forms of cardiac disease.

In the present series there were eight re-operation cases. In one of these (third Cæsarean section) the uterine wall was said to be thin from old scars, and in another case (second Cæsarean section) the lower part of the old scar was found to have given way after the placenta had been removed. It is no uncommon experience, however, to be unable to find a previous scar at the time of a subsequent operation.

Eardley Holland gives the frequency of rupture of Cæsarean section scars in subsequent pregnancies as 4 per cent., the cause being imperfect healing leading to a thin scar which stretches during pregnancy and ruptures on account of increased intra-uterine pressure either during pregnancy or during labour, or, it may be, from an accidental cause.

The chief cause of imperfect healing is, no doubt, infection and possibly the suture material may have something to do with it. Holland seems to be against catgut as a suture material, stating that there is two-and-a-half times the liability to rupture subsequently if it has been employed. He rather favours silkworm gut, although this is a material which, for other purposes, is rarely if ever employed for buried sutures. Any kind of suture material—catgut, silk, silkworm gut—may give excellent results if sepsis is avoided and if the whole thickness of the uterine wall is brought into accurate apposition.

Of the 57 cases, 52 were in labour, 1 was not, and in 4 cases this point was not indicated. One advantage of the patient being in labour when the operation is carried out is that drainage downwards may be more effective, as the os will be definitely open. Also it more or less ensures, as nearly as can be, the full maturity of the child. It is said that the uterus will contract better afterwards if labour is in progress, but the stimulus of the operative interference is quite sufficient for this purpose in the case of a normal uterus. It has been suggested, too, that in primiparæ there may be more tendency to trouble from after-pains, if the operation has been performed before the onset of labour, on account of the retention of discharges in the cavity of the uterus.

But a possible disadvantage in waiting till labour comes on is that arrangements may have to be made in a hurry and results may be prejudiced where such an emergency arises in private practice, necessitating transport to a nursing home at a time when the patient is not very fit for it. It is probably better in a private case, if Cæsarean section has been decided on, to do it at a given date, as nearly as possible just before labour is due to start, or to have the patient in a home in good time and let her wait till labour has just started before operating. It must not be forgotten that there is a distinct danger of sepsis with tragic results if a Cæsarean section is done on a patient who has been much examined or on whom attempts at delivery per vaginam have been unsuccessfully made. Many operators would rather do a craniotomy under such circumstances. The maternal death-rate in Cæsarean section is by no means negligible, death being due to such causes as sepsis and pulmonary embolism.

Sterilisation of patients is a matter for judgment in each case. Sometimes there may be little doubt in coming to a decision. For example, the risk of sepsis may be so great from previous interference that even a hysterectomy may be considered necessary. Again, a uterus may be so damaged by previous Cæsarean sections that it may be advisable to sterilise the patient. But nowadays it is rarely right to sterilise after the first Cæsarean section or at a subsequent one if no living child has been born and has survived, unless the uterine condition is such as to forbid the risk of another pregnancy.

I am indebted to Dr. R. C. Buist and Prof. J. A. Kynoch for permission to use their case records.

TUBERCULOSIS OF THE PERICARDIUM.

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TUBERCULOSIS of the pericardium is not of very common occurrence, and many authors deny altogether the existence of primary pericardial tuberculosis. Hedblom[1] has recently collected from the literature eight cases in which the pericardium was considered to be the primary seat of the disease. F. T. Roberts[2] points out the rarity of miliary tuberculosis of the serous pericardium as compared with other serous membranes, and states that most of the cases are chronic, and secondary to tuberculosis elsewhere, especially of the lungs and bronchial glands. He emphasises the fact that, even in such cases where pericarditis actually exists, it is sometimes difficult or impossible to prove, either histologically or bacteriologically, its tuberculous origin.

Table I. is an analysis of 83 cases of pericarditis which were admitted into the medical wards of St. George's Hospital between the years 1911 and 1921. This number excludes cases of hydropericardium due to back pressure.

TABLE I.—*Analysis of 83 Cases of Pericarditis.*

Type.	No. of cases.	Male.	Female.	Average age.	Percentage.
Rheumatic	54	28	26	15·7	65·5
Renal	13	7	6	36·9	15·7
Pneumonic ..	9	7	2	17·3	10·9
Septic	4	2	2	28·7	4·3
Tuberculous ..	3	1	2	20·3	3·6

TABLE II.—*Details of the Three "Tuberculous" Cases in Table I.*

Case.	Sex.	Age.	Pericardium.	Tuberculosis elsewhere.	Remarks.
1	M	8	Miliary T.B. of serous coat with effusion.	Caseating tuberculosis of mediastinal glands. Miliary T.B. lungs, *pleuræ*, and generalised.	—
2	F	50	Chronic adhesive pericarditis. Serous coat studded with tubercles.	Bilateral apical pulmonary tubercle with bilateral pleural effusions.	Old history pleurisy, with effusion.
3	F	3	Acute serofibrinous pericarditis, with 3 oz. of effusion. Early endocarditis of mitral valve.	Caseating tuberculosis of infratracheal glands. Scattered T.B. in lungs, liver, and elsewhere.	Pericarditis, possibly rheumatic in origin.

Table II. gives details of the three cases, 3·6 per cent. of the total, which were regarded as being tuberculous in origin. It will be noted that in the first two cases there was miliary tuberculosis of the serous coat, but evidence pointed to the spread of this process from elsewhere. In the third case, the tuberculous origin of the process was doubtful.

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[1] Hedblom: Surgical Clinics of North America, Oct. 21st, 1921.
[2] Roberts, F. T.: Allbutt and Rolleston's System of Medicine.

In view of the preceding remarks, the following case, which is not included in the above series, is of interest.

A girl, aged 6, admitted into St. George's Hospital on Jan. 22nd, 1922. According to her mother, she came of a healthy stock, had suffered from influenza, possibly accompanied by left-sided pneumonia, in 1919, but had been perfectly well ever since, until Dec. 28th, 1921. On that day she was feverish, complained of sore throat and rather severe epigastric pain, unaccompanied by vomiting, which passed off after 24 hours. Subsequently there was no return of pain, nor was there undue shortness of breath, but she remained languid, with lack of appetite, and desire to rest. On Jan. 15th there was rather severe cough, she appeared very ill, and was feverish at night.

Condition on Admission.—She appeared well nourished, the tongue was coated, the fauces were not injected, and the tonsils not large. The temperature was 100·8° F., pulse 140, and respirations 44. The apex beat could be felt with difficulty in the normal position; there was no apparent increase in the cardiac dullness, though præcordial percussion was painful. Heart sounds, though distant, appeared not abnormal, and no friction or murmurs were present. Comparative dullness, with very poor air entry, at both bases.

Course of Case.—Subsequent to admission the temperature was erratic, tending to rise to 100° at times, and sometimes normal for 24 hours, but the pulse and respiration-rate remained high, the degree of illness present greatly exceeding the signs of organic disease. On the 24th a skiagram of chest suggested the presence of fluid at both bases. The pericardial shadow was not unduly large, and showed no truncation of the cardio-hepatic angle. On the 28th the left base was explored, and 150 c.cm. of clear sterile fluid was removed, the small lymphocyte being the predominant cell present, though polymorphonuclear and endothelial cells were also numerous. The course of the disease was unaffected by this procedure, and death occurred rather suddenly and unexpectedly on the 28th.

Necropsy.—Both pleuræ contained 8 oz. of clear fluid, and there were recent adhesions at both bases. Both the parietal and visceral pleuræ were free from obvious tubercle. The lungs were intensely engorged, with collapse at the bases, but no tubercles were present either on the surface or on section. The pericardium was fairly firmly adherent to the back of the sternum and costal cartilages by rather fleshy pink adhesions, which appeared to consist partly of fibrous tissue and partly of a substance resembling granulation tissue. There was severe chronic proliferative pericarditis, both fibrous and serous coats being much thickened and laminated, varying in places from ¼ to ½ inch in thickness, especially at the apex. The inner surface of the pericardium and epicardium was covered by a thick "pile" of granulations, to which were adherent pedunculated masses of partially organised lymph, these masses being remarkably uniform in size, and somewhat resembling "melon-seed bodies." Some of these masses formed adhesions between the layers, imperfectly dividing the cavity into loculi, which contained a little turbid fluid. No recognisable tubercles were present. The heart muscle, on section, was firm and good, there being no mural tubercles. The valves were normal. The peritoneum showed severe œdema, and contained ten oz. of fluid similar to that from the pleura, but showed no tubercle. The liver was hard, and showed early "nutmeg" change. Scattered over its capsule were a few tubercles of the size of a pin's head, some of them showing commencing caseation, whilst, on section, a few similar tubercles were scattered throughout. The spleen was hard, firm, and tough on section. On its anterior margin was a caseating tuberculous focus of the size of a pea, whilst, on section, there were scattered foci resembling those of the liver. The kidneys were normal and free from tubercle, and there was no tuberculosis elsewhere. The lymphatic glands showed no obvious abnormality, whilst the infra-tracheal glands, believed by many to be the focus from which tuberculosis spreads to the pericardium, were very small and insignificant.

Microscopically, several mediastinal lymph glands were examined, and in all there was marked venous engorgement, though no tubercle was detected. Sections stained by Ziehl-Neelsen's method showed no tubercle bacilli. Sections from the pericardium showed great increase in thickness of the fibrous coat, the tissues being laminated and very cellular, the spaces between the laminæ being richly infiltrated with round cells, in some places these being so massed as to present the appearance of lymphoid tissue. The serous coat was not recognisable, but was replaced by typical granulation tissue, with loops of new and well-formed capillary vessels reaching to the surface. No giant-cell systems were recognisable, and no tubercle bacilli were present in the granulation tissue. Sections through the lymph masses showed thick fibrin, with many degenerated white cells and masses of their nuclear debris.

The interest in this case lies in the relation of the pericarditis to the tuberculous lesions, and further emphasises the care with which these cases should be investigated. It was unfortunate that, in this case, no inoculation tests were undertaken with material from the pericardium. The pleural and peritoneal exudates probably resulted from back pressure, a supposition supported not only by the hepatic condition, but also by the remarkable degree of œdema of the peritoneum. If it is assumed that the pericarditis was tuberculous in origin, in view of its chronic proliferative nature it would appear to have been the primary seat of the disease. If, on the other hand, the pericarditis was due to other causes, as from a tonsillar organism, it is difficult to explain the focus from which the miliary tubercles in the spleen and liver originated.

Clinical and Laboratory Notes.

NOTE ON "BAKERS' ECZEMA."

By ARNOLD ROWSBY TANKARD, F.I.C.,
PUBLIC ANALYST FOR THE CITY OF HULL.

IN January, 1913, a journeyman baker called to show me his forearms, which almost up to the elbows presented a definite eczematous condition. This "eczema" became at times so severe that it was difficult for the bakers to continue their employment. It appeared that several different kinds of wheat-flour were used for bread-making at the bakery in question, but the bakers had noticed that it was only with one brand of flour that the "eczema" made its appearance. Several bakers were affected by irritation of the hands and arms, and later with "eczema," when this particular flour was being worked up.

As a sample of the flour revealed no abnormality of composition when subjected to the usual methods of chemical analysis, I made a careful study of the patent literature dealing with the addition of so-called "improvers" to flour, and from a formidable list of chemicals which have been suggested for this purpose several were chosen for investigation. Without going into further detail, it may be stated that one of the substances considered likely to cause trouble when brought into contact with delicate skin surfaces was potassium persulphate, owing to its known acid formation when moistened with water:—

$$\underset{\text{Potassium persulphate.}}{2\,K_2S_2O_8}+2\,H_2O=4\,\underset{\text{Potassium acid sulphate.}}{KHSO_4}+O_2.$$

Investigation showed that the suspected flour contained this chemical to an appreciable extent, although the amount was *not sufficient* to cause any noticeable increase of the normal content of mineral matter present in flour of that grade.

The information given to me by the baker made it quite clear that this flour containing persulphates was the only one causing any trouble, and it was stated that the men were declining to work this particular flour owing to its action on the skin. Later, samples of this flour obtained from the miller on delivery to a local grocer were examined and found to contain potassium persulphate, and action was then taken under the Sale of Food and Drugs Acts against the actual miller for selling flour not of the nature, substance, and quality demanded, by reason of the fact that it contained a foreign mineral substance, potassium persulphate, to the extent of 6·3 parts per 100,000. The case was heard before the stipendiary magistrate at Hull in 1913, the hearing occupying four days, but after the expenditure of a considerable sum of public money, with the sole idea of protecting the public from the undeclared addition of foreign substances to flour—substances which may or may not be harmful, either in themselves or by reason of impurities introduced with them—the case was dismissed, each side paying its own costs. The opinion of the Local Government Board at that period was that the law as it stood was sufficiently strong to prevent such additions, but this case showed that such practices could not be effectually stopped by action under the Sale of Food and Drugs Acts; and although a Bill was introduced some years ago into Parliament making provision for such cases, it was not proceeded with, and the present position remains quite unsatisfactory. It had been hoped by many food chemists and others that the Ministry of Health would before now have taken steps to prevent such additions to flour, but unfortunately nothing has been done in this direction.

The Lancet, in an annotation in its issue of July 7th[1] last, cites a case of sensitisation to wheat-flour which produced chronic eczema in a woman; and O. de Jong, in a recent paper on "A Suggested Ætiology of Bakers' Dermatitis,"[2] accounts for such cases by the presence of salt in the yeast mixture and in the dough handled by bakers. If this explanation is sound, then a similar condition amongst bakers should have been common for many years. This, however, is contrary to my information. It would be interesting to know whether these skin affections among bakery workers occurred with any frequency prior to 1911, the date of the first patent for the use of persulphates as "flour-improvers," and whether the flour handled by de Jong's patients contained this chemical. A flour may appear normal in every respect and yet contain persulphates, for which a specific search must be made. In Hull, at least, common salt without persulphate in the flour caused no such trouble to the bakers in the particular bakery where my informant was engaged.

The cases of "bakers' eczema" which have occurred in this city, so far as they are known to me, have always resulted from the handling of "wetted" flour—that is to say, the dough mixture, which to a greater or less extent comes into contact with the arms during the process of hand-mixing. This is precisely what one would expect in the case of a substance like potassium persulphate, which decomposes fairly rapidly under these conditions, with formation of potassium acid sulphate, as stated. I have no doubt that, so far as the cases brought to my notice in Hull are concerned, the cause was the presence of potassium persulphate in the flour, since (1) only when flour containing potassium persulphate was being used was any skin trouble evident, and then only when the flour was handled in a moistened state; and (2) when this flour was not used, but flour free from potassium persulphate substituted, with salt, yeast, &c., as usual, no trouble was experienced, and the eczematous condition of the skin of the affected workers gradually disappeared.

HERNIA OF THE VERMIFORM APPENDIX THROUGH HESSELBACH'S TRIANGLE.

By Margaret W. Snodgrass, M.B., B.Ch. Belf.,
HOUSE SURGEON, DORSET COUNTY HOSPITAL, DORCHESTER.

The following case of a hernia of the appendix merits record:—

A male, aged 70, was admitted to this hospital under the care of Mr. W. B. Cosens with the diagnosis of right strangulated hernia. He had a previous history of left inguinal hernia for 20 years, with no history of any trouble on the right side. On examination a tumour, the size of a small tangerine orange, was found occupying the region just above the inner third of the right Poupart's ligament; the mass was tender, with slight lateral movement, and pain was referred to the umbilicus. The early symptoms of strangulation had been present for 24 hours.

Operation revealed the appendix in a mass of omental adhesions passing through Hesselbach's triangle; the inguinal canal was normal.

It would be interesting to know if there has been any case reported of the appendix *alone* finding its way through this anatomical region.

Reviews and Notices of Books.

The Older Universities of England: Oxford and Cambridge.

By Albert Mansbridge, Hon. M.A. Oxon. London: Longmans, Green and Co. 1923. Pp. 296. 7*s.* 6*d.*

This remarkable book is written by one who was not educated at either university, but who in some mysterious way understands the university spirit and is quite alive to the influence which Oxford and Cambridge should, and as a rule do, exercise. There are still some who sigh for the placid days before 1850 when the Commission was instituted which so vexed the soul of Archdeacon Grantly and many another, when the Hebdomadal Council was all powerful and when Newman in the pulpit of the University Church was making young men to realise the fact that they had spiritual duties to perform.

It was between 1870 and 1880 that both universities awoke to the fact that what is now called "social service" was a duty which the rich owed to the poor, and a university sermon by Pusey preached in 1875 laid solemn stress upon this:—

> "Many of you, my sons, are provided with superfluities. You have not to stint yourselves as to the pleasures of your age. Day by day, I suppose, passes with all conveniences of life or amusement, or some self-indulgences, which though not directly sinful, are rather injurious. If our Lord was to come now, in how many do you think that you could tell Him that you had fed Him, clothed Him, supplied Him when sick? Some, I fear, could not say that they had bestowed as much upon Christ as upon their dogs."

But though individual members of the university, as is shown by the foundation of university settlements, were not deaf to the call of those who had never enjoyed a university career, practically nothing was done to make the way of the poor scholar easier. One of the evils wrought by the Commission of 1850 was the abolition of the "poverty clauses" and the substitution of "merit" which meant ability to pass examinations, an abolition which Dean Burgon deplored (v., p. 109). So, says Mr. Mansbridge on the same page, "the most difficult time for the poor scholar to get to Oxford or Cambridge was from 1854 to 1904." But although Mr. Mansbridge is all for giving working men and women every facility of access to university life and teaching he is no iconoclast. He recognises that there is in university life an atmosphere or environment which makes men love knowledge for its own sake and not for that of utility.

> "Directly Oxford and Cambridge seek to conform themselves to modern needs, to justify themselves to the Philistines outside—however excellent in other ways such Philistines may be—they may do more work which can be recorded in elaborate tomes, they may send out more young men to perform the tasks of the city and the factory, but they will lose that ineffable charm, that pulsating power, that mysterious influence which calls forth the veneration of men in other universities and in other lands,"

and he quotes with approval the remark of a Master of Corpus, Cambridge: "Cambridge is not primarily a place of learning or a place of examination. It is a place where you live three years."

Mr. John Mansbridge's illustrations are worthy of the book, especially the reproductions from pencil sketches; his drawings in Loggan's style are not so successful and the view of Magdalen is really bad. We have noticed a few slips in the text—e.g., on p. 217 Tennyson's date is given as 1809–1902, instead of 1892, and in the index Dr. Routh is entered as Master of Magdalen instead of President. But until we read the book we could not have believed that an outsider could so have caught the spirit of a university or have written so sympathetically. Mr. Albert Mansbridge was nominated as one of the Commissioners of 1919–22 and no better selection could have been made. Every university man and every man who seeks to be a university man should read the book.

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[1] The Lancet, 1923, ii., 28.

[2] Ibid., 1923, i., 894.

CONTRACEPTION (BIRTH CONTROL): ITS THEORY, HISTORY, AND PRACTICE.

A Manual for the Medical and Legal Professions. By MARIE CARMICHAEL STOPES, D.Sc. Lond., Ph.D. Munich, *Fellow of University College*, London. London: John Bale, Sons and Danielsson. 1923. Pp. 417. 12*s*. 6*d*.

Dr. Stopes tells us in her preface that this book represents the arduous toil of four years; in it she has endeavoured to set out clearly all that is valuable of available knowledge on contraception, hoping thus to have cleared the way for the initiation of deeper researches as well as for the determination of the best practical means of contraception to suit specific cases. In the 14 chapters which follow Dr. Stopes sets out with precision and no little literary grace the problem of contraception as she sees it, the indications for its use, a description of contraceptives desirable and undesirable, answers to some objections which have been raised, the history of its practice in this and other countries, and a note on the need for instruction in medical schools. Finally, she describes the daily practice of the birth control clinic inaugurated by her in Holloway. The parents visiting this clinic are, Dr. Stopes tells us, made to feel that they come not to talk about disease, nor to be subjected to operation, but "to discuss in an inspiring way in attractive surroundings one of the greatest and one of the most racially vital questions which arise in their lives." No letter of introduction is required, no fees are taken. Any mother or father, who desires to do so, can walk into the clinic at any time. The simple and decent procedure is described, and Dr. Stopes adds that few women require a second instruction, although the friendly atmosphere of the clinic and the sympathy of the nurse encourage them to come again if difficulty should arise. Dr. Stopes concludes her book by describing the practice of contraception as "in many ways the connecting link between health and disease." The prime object of the medical profession being the health of the community, she regards a full knowledge of contraception as one of the doctor's most useful adjuncts, for "when used by diseased persons contraception becomes the great preventive measure to arrest the spread of disease and degeneracy through the nation." We find some essential truth in this declaration along with some of the exaggeration which is characteristic of the prophet who believes that a message is entrusted to him or her alone. Just as it is futile to try to promote the general health of the community without an intimate study of the early beginnings of disease or the deviations from normal function, so no doubt the practice of normal healthy sex relations cannot be put on a firm footing without close study.

Much of the evidence contained in the book is quite unobtainable elsewhere, for the author has been the confidante of hosts of marital difficulties. Were it not in fact for the opening pages of the volume the medical reader would feel inclined to accept it as a text-book on a specialty in which the author has made herself proficient. But a feeling of doubt and perplexity is engendered by the extraordinary number of introductions from distinguished medical men and women which precede the opening chapter. Sir William Bayliss first sets out the two chief arguments in favour of birth control, the *one being* the relief of the mother from the results of frequently repeated pregnancies, the other, like unto it, being the possibility of a normal and beautiful married love—a possibility which, he adds, Dr. Stopes has had the honour of bringing out into a clear light. The records kept at the mother's clinic will, he hopes, in time lead to the accumulation of valuable information so that we may be able presently to recommend *the* best method in any given case and to issue warning against the use of those likely to be injurious. Sir James Barr approaches the subject from the racial point of view and laughs *to* scorn the argument that if young women knew the use of contraceptives they would lose any morality which they now possess. The sentimental stuff contained in prurient novels should, he thinks, be replaced by genuine information. The innocence of ignorance is not worth preserving. Dr. Christopher Rolleston testifies to the value of Dr. Stopes's book to the medical officer of the smaller English counties who, unlike his brother in larger cities, comes into intimate clinical contact with his neighbours from their birth (or before) to their death. Dr. Jane Hawthorne adds a brief benediction and a medical barrister-at-law, who signs himself "Obscurus," justly compliments the author on having given references for every quotation she has made, but does her disservice in stating that, had she been on the Medical Register, she might well have been cited before the General Medical Council to answer for her views. Whatever disciplinary terrors the Council may wield, it certainly never questions the right of the thinking men or women whom it registers to hold what views are dictated to them by knowledge or conscience.

NEUROLOGICAL DIAGNOSIS.

Kompendium der topischen Gehirn- und Rückenmarksdiagnostik. By ROBERT BING, Professor in the University of Basel. Fifth enlarged and corrected edition. Berlin and Vienna: Urban and Schwarzenberg. 1922. With 102 illustrations, partly in colour. Pp. 242. M.450.

Dr. Robert Bing's book on neurological diagnosis is well known in this country and has been frequently reviewed in these columns. The latest edition contains various additions and corrections which do not add materially to its length. There are some new diagrams and illustrations, the former characterised by the same simplicity and clearness that have been features of Dr. Bing's diagrams from the outset. Eschewing controversy and speculation, the author confines himself, with singular success, to the anatomy and physiology, normal and pathological, of the nervous system, and if it is impossible for him to avoid some vexed questions—e.g., that of the relation of the corpus striatum to other centres, above and below—his teaching is sufficiently definite to be instructive, even though exception might easily be taken to some of his statements. One or two of the criticisms we offered in a previous review have been met, but there are others which if accepted would, we believe, bring the work even more close to that ideal of neurological doctrine which every teacher desires. The fact that a fifth edition is issued is comment enough on the practical nature of this compendium, which can once more be recommended to all students of the nervous system and its disorders.

TUBERCLE BACILLUS INFECTION AND TUBERCULOSIS IN MAN AND ANIMALS.

By Albert Calmette. Authorised translation by WILLARD B. SOPER, M.D., and GEORGE H. SMITH, Ph.D. Baltimore, U.S.A.: Williams and Wilkins Company. 1923. Pp. 689.

THE original French edition of this valuable book was noticed in THE LANCET (1920, ii., p. 74) on its publication, and though there *is little* to add to what was then said, it is a pleasure to welcome this authorised English edition. The translators have performed their task admirably, and have added the index which was omitted from the original work, after the regrettable custom of France. They have been ably supported by their publishers and *the* result is a volume which should be in the library of every student of tuberculosis, whether he *works* on the clinical side or in the laboratory. Quite apart from the wealth of information it contains, this monograph has a value which it is difficult to over*estimate*. The author's *individuality* is stamped on every page, and he *has* given us not only a brilliant account of the present state of knowledge of tuberculosis, but also a model of what constitutes the best type of scientific work.

HÆMATOLOGY AND HISTOLOGY.

Traité technique d'hématologie, morphologie, histogenèse, histophysiologie, histopathologie. Par J. JOLLY, Directeur du Laboratoire d'Histologie de l'École dés Hautes Etudes au Collège de France. Paris: A. Maloine et Fils. 1923. With 69 figures in the text and one coloured plate. Two vols. Pp. 1130. Fr.70.

THE author holds that all sound biological work must rest upon a basis of morphology and histology, and he has furnished the proof of his doctrine, if any proof is necessary, in this exhaustive treatise. It is essentially a monograph on the structure of the cellular elements of the blood, but Mr. Jolly loses no opportunity of pointing out how function depends on structure, and how the one varies with the other. The book is planned on the broadest possible lines. The first few pages contain instructions how to obtain blood from animals, birds, fishes, and reptiles, and though naturally man is the chief subject of observation, the author never hesitates to refer to lower orders of life when necessary. Though the morphology and the quantitative variations of the cells of the circulating blood, including, we may note, the platelets, are treated of in detail, this aspect of the question forms only a part, and not the greater part, of the book. The wandering cells of the tissues in normal and pathological states are described at length; and there are equally comprehensive chapters dealing with the structure of lymphadenoid tissue, the spleen, the bone-marrow, and the thymus. There are chapters on hæmoglobin, the coagulation of the blood, hæmolysis, and histogenesis. The last chapter on the relations of the blood with the body and with the outside world is not the least valuable. Mr. Jolly has written a truly philosophical treatise on an intensely interesting subject. If we have omitted to mention that there are chapters dealing with the anæmias and the leukæmias it is because these abnormal states are put in their proper place; they exist, and they are faithfully dealt with, but for Mr. Jolly the study of the blood means much more than it does to most medical authors. The illustrations are adequate, and the format of these paper-bound volumes leaves nothing to be desired.

VENTILATION.

The Ventilation of Public Buildings. By ROBERT BOYLE. London: Robert Boyle and Son. 1923. Pp. 51. 6s.

THIS very short book contains a compilation of statements by various individuals in favour of the natural system of ventilation. There is little general information on ventilation, the object apparently being to advertise the fact that the consensus of opinion in this country is in favour of the natural system of ventilation and opposed to all artificial systems. The book is illustrated.

Calculations in Heating and Ventilation. By G. S. COLEMAN, D.Sc., Assoc.M.Inst.C.E., Director of the Department of Municipal and Sanitary Engineering in the Municipal College of Technology, Manchester. London: Longmans, Green and Co. 1923. Pp. 249. 15s.

THE main object of this excellent book is to provide working examples for students taking the second and third years in the advanced course in heating and ventilating engineering at the Municipal College of Technology, Manchester. The author claims no originality and expresses his debt to the more comprehensive and standard works. In addition to the chapters on calculations, there are chapters on mechanics and physics, conveniently placed for reference, and a means of saving the student much time. The book contains instructive illustrations, tables, and charts, and also much technical information in a readable form. More space could have been allotted with advantage to the kata-thermometer, an instrument which has now proved its value in many countries.

DELAFIELD AND PRUDDEN'S TEXT-BOOK OF PATHOLOGY.

Twelfth edition. Revised by FRANCES CARTER WOOD, M.D., Director of the Pathological Department, St. Luke's Hospital, New York; Director of the Institute of Cancer Research, Columbia University, New York. New York: William Wood and Co. 1922. Pp. 1354. 63s.

THE twelfth edition of this excellent text-book differs little from the previous one published in 1920, though it has been subjected to a careful and detailed revision. The sections on the liver and the central nervous system contain a good deal of new matter and are improved by additional and useful illustrations; and portions of the section on tumours have been rewritten. By careful pruning the author has succeeded in effecting these changes without increasing the size of the book, which remains one of the most satisfactory examples of its kind.

A SURGICAL ATLAS.

Spezielle Chirurgie. Part II. Second edition. By Prof. G. SULTAN. München: J. F. Lehmann. 1923. Pp. 576. 14*s.* 5*d.*

THIS is a revised edition of a well-known surgical atlas. The illustrations do not differ very much from those which appeared in the former edition, but the letterpress has been considerably altered. Certain illustrations and descriptions might well have been omitted, such as Kocher's method for the radical cure of hernia, and possibly, too, the technique of the use of Murphy's button, which now is only of historical interest. There are some rare conditions depicted which one very seldom meets. The atlas is a collection of extremely good pictures which really help the student to visualise disease which he may not have had an opportunity of seeing.

DISEASES OF SALIVARY GLANDS AND PANCREAS.

Nouveau traité de médecine. Vol. XV. *Glandes salivaires, pancréas, et péritoine.* Edited by G. H. ROGER, FERNAND WIDAL, and P. J. TEISSIER. Paris: Masson et Cie. 1923. Pp. 568. Fr. 40.

THE fifteenth volume of this System of Medicine bears the same signs of scholarship and scrupulous preparation that we have observed in earlier volumes. Dr. E. Parmentier and Dr. Etienne Charbrol are responsible for the section dealing with the salivary glands and the pancreas. We have been particularly impressed by their excellent discussion of the pathology of diabetes. In reading this article on page 80, with its cold and logical exposition of the arguments for and against the pancreatic theory, one feels the enormous importance of the work of F. G. Banting and how sensibly future progress in pathology must be modified by this new knowledge. The problems of pancreatitis are no less ably dealt with, this section being, like others, enriched by collections of statistics which are of great value. The major portion of the last section of the volume, which deals with diseases of the peritoneum, is by Dr. Paul Londe, and is marked by the same scrupulous care. We have no hesitation in recommending this as an admirable reference work.

JOURNALS.

TROPICAL DISEASES BULLETIN. July, 1923.—An instructive feature of the July number of the *Tropical Diseases Bulletin* is the critical review, by C. M. Wenyon, of the bodies in the blood which have, from time to time, been described as "hæmogregarines" of man.—Clayton Lane contributes a number of reviews on malaria, while C. M. Wenyon is responsible for the sections dealing with kala-azar, relapsing fever, infectious jaundice, and yellow fever.—Novel laboratory methods are summarised by J. D. Thomson, and under the miscellaneous category subjects such as psychoses and rabies are dealt with.

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS, H TO O.

WE are requested by the Registrar of the General Medical Council to publish the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. The list includes all untraceable names from H to O in the body of the Medical Register, as it is only this section which has come under review this year. Anyone who finds his or her name included in this list should communicate immediately with the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1. Since this list was prepared a large number of further inquiries have been sent out, but it would be advisable that in all cases in which a practitioner's name appears in the list a communication should be addressed to the Registrar.

Hackett, Henry W., L., L.M.R.C.P. 1917 (I).
Haigh, William E., M.R.C.S. 1909 (E).
Halahan, Samuel H., M.B. 1885 (I).
Hall, Alexander R., M.R.C.S. 1902 (E).
Hall, Thomas Gibson H., L.R.C.S. 1883 (I).
Hall, Thomas Greenwood, M.B. 1891 (E).
Hallam, Walter, M.R.C.S. 1874 (E).
Hamilton, Archibald A., M.B. 1880 (I).
Hamilton, Chas. K. J., M.B. 1920 (E).
Hamilton, Jas. A. G., M.B. 1876 (I).
Hamilton, Percy D., M.R.C.S. 1912 (E).
Hamilton, Reginald H., L.M.K.Q.C.P. 1889 (E).
Hamilton, Roger K., M.R.C.S. 1896 (E).
Hamilton, Seton Guthrie, M.R.C.S. 1879 (E).
Hance, James B., *O.B.E.*, M.R.C.S. 1911 (E).
Hanly, Edward, M.D. 1879 (I).
Hanly, John Joseph, L.R.C.P. 1884 (E).
Hannen, John J., M.R.C.S. 1885 (E).
Hannigan, Charles Ignatius, M.B. 1914 (I).
Hannigan, Francis, L., L.M.R.C.P. 1912 (I).
Hanson, Reginald J. E., *O.B.E.*, M.B. 1896 (E).
Hanwell, Gerald L., M.R.C.S. 1896 (E).
Hardy, George F., *M.C.*, M.R.C.S. 1905 (E).
Harper, Rodolphus W., M.B. 1905 (I).
Harris, Edward Temple, *D.S.O.*, B.C. 1903 (E).
Harris, *Matthew H.*, M.B. *1903* (E).
Harrison, Herbert M., M.R.C.S. 1895 (E).
Harrison, Howard D., M.R.C.S. 1912 (E).
Harrison, Richard, L.R.C.P. 1884 (E).
Harrison, Thomas, L.R.C.P. 1909 (E).
Hart, Charles Herbert, M.R.C.S. 1911 (E).
Hartgill, Wm. C., *M.C.*, M.R.C.S. 1914 (E).
Harvey, Frederick George, M.R.C.S. 1875 (E).
Haslam, Sarah Kate K., L.S.A. 1901 (E).
Hastings, John P., M.R.C.S. 1907 (E).
Hatherly, Henry R., M.R.C.S. 1864 (E).
Haughton, Wm. S., M.B. 1894 (I).
Haw, Walter H., M.R.C.S. 1884 (E).
Hawker, Walter, L.S.A. 1891 (E).
Hawkins, Charles Thomas, M.R.C.S. 1908 (E).
Hawks, Francis S., L.M.S.S.A. 1908 (E).
Hayden, Richard H. H., L., L.M.R.C.P. 1892 (I).
Hayes, Richard F., L., L.M.R.C.P. 1905 (I).
Hayes, Wm. B., M.D. 1886 (I).
Hayne, Percy A., M.R.C.S. 1902 (E).
Haysom, Nathan N., M.R.C.S. 1916 (E).
Hayward, John W., M.R.C.S. 1861 (E).
Head, Ernest Edward, M.R.C.S. 1895 (E).
Head, Percy T. J., L.S.A. 1876 (E).
Healy, Denis, M.B. 1921 (I).
Hearn, Douglas E., L.M.S.S.A. 1917 (E).
Hebbert, Charles A., M.R.C.S. 1880 (E).
Heberden, Wm. S., M.R.C.S. 1889 (E).
Heeland, Patrick A., L.R.C.S. 1885 (I).
Hegarty, Andrew, M.D. 1868 (I).
Hegarty, Patrick N., L., L.M.R.C.P. 1919 (I).
Hennessy, Cornelius, L., L.M.R.C.P. 1918 (I).
Hennessy, Thomas, L., L.M.R.C.P. 1894 (I).
Henry, Edwin, M.R.C.S. 1892 (E).
Henry, John R., M.B. 1913 (I).
Henry, Louis, L.R.C.P. 1878 (E).
Hepburn, John, L.S.A. 1880 (E).
Hepper, Evelyn C., M.R.C.S. 1900 (E).
Herring, Edward K., M.R.C.S. 1896 (E).
Heslop, William J., L.M.K.Q.C.P. 1877 (E).
Hetherington, Charles E., M.B. 1870 (I).
Heywood, Thomas, M.R.C.S. 1892 (E).
Hickey, Augustus J., *M.C.*, M.R.C.S. 1910 (E).
Hickey, Patrick C., M.D. 1879 (I).
Higgins, George H., M.R.C.S. 1876 (E).
Hill, John S., M.B. 1883 (E).
Hill, John T., L., L.M.R.C.P. 1912 (I).
Hill, Richard A. P., M.R.C.S. 1906 (E).
Hindle, Francis Joseph, L.R.C.P. 1880 (E).
Hislop, Walter J. H., M.B. 1896 (E).
Ho, Shai C., L.M.S.S.A. 1918 (E).
Hodder Williams, F. G., M.B. 1908 (E).
Hodgins, Emerson Le R., M.R.C.S. 1907 (E).
Hogg, Charles A., M.B. 1893 (E).
Holden, Frank N., L., L.M.R.C.P. 1908 (I).
Holland, Edward, M.B. 1921 (I).
Holland, James F. R., M.D. 1879 (E).
Holland, James K., L., L.M.R.C.P. 1917 (I).
Holmes, Arthur N., M.B. 1901 (I).
Holmes, John, M.R.C.S. 1897 (E).
Hood, James C., M.D. 1883 (I).
Hooper, Ebenezer, L.S.A. 1886 (E).
Hooper, Henry Walpole, M.R.C.S. 1883 (E).
Hope, Edward C., M.R.C.S. 1896 (E).
Hopkins, John, M.R.C.S. 1869 (E).
Horan, John W., M.B. 1915 (I).
Hosford, John S., M.R.C.S. 1895 (E).
Hounsell, F. C. W., M.R.C.S. 1886 (E).
Howard, Robert N., M.R.C.S. 1880 (E).
Howden, Patrick F., L.S.A. 1905 (E).
Howson, Frank, M.R.C.S. 1910 (E).
Hoysted, L. N., M.R.C.S. 1887 (E).
Hoyte, S., M.R.C.S. 1910 (E).
Hoyten, W. J., M.R.C.S. 1894 (E).
Hughes, Hugh L., L.S.A. 1886 (E).
Hughes, Wilfrid K., M.R.C.S. 1890 (E).
Hull, Walter, M.R.C.S. 1882 (E).
Humphreys, Miss L. N., M.B. 1920 (I).
Humphry, Ernest, L.S.A. 1884 (E).
Hungerford, L. M. T., L., L.M.R.C.P. *1889 (I)*.
Huntley, Miss E. A., L.R.C.P. 1887 (E).
Hutchinson, C. G., L.K.Q.C.P. 1885 (E).
Hutton, John, M.R.C.S. 1887 (E).
Hyde, Edwin, M.R.C.S. 1902 (E).
Hynes, A. M., M.R.C.S. 1873 (E).

Iddon, T. W., M.R.C.S. 1887 (E).
Ironside, Miss C. M., *M.B.E.*, M.B. 1903 (E).
Irwin, Miss M. E., M.B. 1918 (I).
Island, Robert L., L.K.Q.C.P. 1886 (I).

Jackson, George H., M.R.C.S. 1878 (E).
Jackson, Harold E. A., M.R.C.S. 1901 (E).
Jackson, Herbert V., M.R.C.S. 1920 (E).
Jacques, Harold, L.S.A. 1903 (E).
Jakins, Wm. V., M.R.C.S. 1858 (E).
James, Walter E., M.R.C.S. 1890 (E).
Jameson, G. B., M.R.C.S. 1913 (E).
Jarrett, M. L., M.R.C.S. 1874 (E).
Jarvis, J. H. E., M.R.C.S. 1887 (E).
Jenkins, Arthur W., M.R.C.S. 1894 (E).
Jenkins, N. R., M.R.C.S. 1917 (E).
Jeppe, T. J. J., M.R.C.S. 1913 (E).
Johnson, Frederick, M.R.C.S. 1891 (E).
Johnson, J. B., L.S.A. 1881 (E).
Johnson, Reginald, M.B. 1912 (I).
Johnston, George D., M.R.C.S. 1883 (E).
Johnston, H. S., L.M.R.C.P. *1908 (I)*.
Johnston, James P., L.M.R.C.P. 1910 (I).
Johnstone, J. G., M.R.C.S. 1921 (E).
Jones, E. A., M.R.C.S. 1902 (E).
Jones, F. W., M.R.C.S. 1904 (E).
Jones, G. B. M., M.R.C.S. 1886 (E).
Jones, John, M.R.C.S. 1904 (E).
Jones, R. T., L.R.C.P. 1893 (E).
Jones, T. S., M.R.C.S. 1885 (E).
Joseph, G. W., L.K.Q.C.P. 1873 (E).
Joule, John, L.S.A. 1892 (E).
Joy, H. R. L., M.B. 1896 (I).
Joyce, T., M.R.C.S. 1858 (E).
Joynt, H. W., L.Med., L.S. 1870 (I).
Judah, N. J., M.B. 1911 (E).
Judd, C. F., M.B. 1913 (I).
Juett, A., M.B. 1913 (E).
Jurriaanse, A., L.S.A. 1903 (E).

Kaka, S. M., M.R.C.S. 1885 (E).
Kamchorn, N., M.R.C.S. 1917 (E).
Kan, T. L., M.R.C.S. 1916 (E).
Kapo, S., M.B. 1912 (E).
Kapur, K. L., M.B. 1912 (E).
Kauffmann, O. J., M.R.C.S. 1885 (E).
Kay, H. W. A., L.M.R.C.P. 1908 (I).
Kaye, W. H., M.R.C.S. 1904 (E).
Kean, *Edmund*, *M.B. 1916 (I)*.
Keats, B. A., L.M.S.S.A. 1909 (E).
Keegan, J. M., M.B. 1890 (I).
Keess, Arthur, L.R.C.P. 1882 (E).
Kelly, C. I., L.S.A. 1891 (E).
Kelly, I. P., M.B. 1911 (I).
Kelly, J. B., L.M.R.C.P. 1907 (I).
Kelly, Thomas, L.M.R.C.P. 1904 (I).
Kelly, Thomas, M.B. 1916 (I).
Kelly, T. J., L.Med. 1872 (I).
Kelly, T. J. B., L.M.R.C.P. 1905 (I).
Kelly, William, M.R.C.S. 1872 (E).
Kelman, G. A. *E.*, *M.R.C.S. 1911 (E)*.
Kendall, N. E., M.R.C.S. 1915 (E).
Kendle, F. W., M.R.C.S. 1884 (E).
Kenna, P. J., M.B. 1888 (E).
Kennedy, J. S., M.R.C.S. 1915 (E).
Kennedy, O. E., M.R.C.S. 1920 (E).
Kennedy, Patrick, L.R.C.S. 1873 (I).
Kerans, Robert, L.R.C.S. 1863 (I).
Kerr, C. D., M.B. 1911 (E).
Kerr, T. B., M.B. 1896 (I).
Kerrigan, O. P., L.R.C.P. 1880 (I).
Kerruish, Miss F. M., M.R.C.S. 1918 (E).
Kerswill, J. B., M.R.C.S. 1865 (E).
Keys, S. H., M.R.C.S. 1914 (E).
Khan, M. A., M.R.C.S. 1889 (E).
Kiernan, P. J., L.R.C.S. 1884 (I).
Kilgarriff, J. O., M.B. 1889 (I).
Kincaid, F., M.R.C.S. 1902 (E).
King, F. W. R. J., M.R.C.S. 1890 (E).
King, G. W., M.R.C.S. 1914 (E).
King, T. W., M.D. 1862 (E).
Kinsella, J. J., M.B. 1897 (I).
Klein, B. G., M.B. 1908 (E).
Knaggs, S. T., L.K.Q.C.P. 1870 (I).
Knapp, Arthur E., L.Med., L.S. 1907 (I).
Knight, W. J. R., *M.C.*, M.D. 1881 (I).
Knocker, W. D., M.R.C.S. 1895 (E).
Knott, M. O., L.R.C.S. 1863 (I).
Knox, C. F., M.R.C.S. 1874 (E).
Koch, J. A., L.M.S.S.A. 1909 (E).
Kochhar, M. R., L.R.C.P. 1911 (E).

Labiebe, K. M., M.B. 1914 (E).
Lamb, H. T., *M.C.*, L.M.S.S.A. 1916 (E)
Land, Mrs. D. E., L.R.C.P. 1910 (E).
Lane, C. A., M.R.C.S. 1893 (E).
Lane, James, L.M.R.C.S. 1882 (I).
Lane, J. S., L.M.R.C.P. 1901 (I).
Lane, W. F., L.M.R.C.P. 1909 (I).
Langley, J. T., M.R.C.S. 1865 (E).
Langston, T., M.R.C.S. 1863 (E).
Lanyon, E. T., M.R.C.S. 1896 (E).
Larche, J. E., M.B. 1915 (E).
Larsen, Miss C., M.B. 1912 (E).
Latimer, G. D., M.B. 1913 (I).
La Touche, E. D., L.R.C.S. 1884 (I).
Lauder, J. L., *D.S.O.*, *M.C.*, M.R.C.S. 1913 (E).
Lawrence, A. A. H., M.R.C.S. 1905 (E).
Lawson, E. F., M.B. 1911 (I).
Lea, J. A., L.R.C.P. 1870 (E).
Le Bas, Dumaresq, M.R.C.S. 1903 (E).
Leech, J. R., M.D. 1872 (I).
Leeder, F. B., M.R.C.S. 1891 (E).
Leeper, B. C. A., L., L.M.R.C.P. 1907 (I).
Lehmann, Mrs. H. B. A., L., L.M.R.C.P. 1881 (E).
Lennon, John, M.B., 1896 (I).
Leonard, Miss E., L.R.C.P. 1902 (E).
Leonard, Napoleon, M.R.C.S. 1902 (E).
Lester, F. H., B.C. 1909 (E).
Lethbridge, C. F., M.R.C.S. 1865 (E).
Lever, J. M., M.B. 1917 (E).
Leviseur, H. J., M.R.C.S. 1918 (E).
Levy, O. L., M.R.C.S. 1895 (E).
Lewellin, A. J. R., L.K.Q.C.P. 1879 (E).
Lewin, Miss J. A., M.B. 1904 (E).
Lewis, F. W., M.R.C.S. *1894* (E).
Lewis, Stanley, M.B. 1891 (E).
Lewis, T. P., M.R.C.S. *1876* (E).
Leyland, P. F. J., L., L.M.R.C.P. 1906 (I).
Libby, H. S., M.R.C.S. *1900* (E).
Liebson, S. A., M.R.C.S. 1915 (E).
Lilley, J. H., M.B. 1884 (E).
Lillies, H., M.R.C.S. 1879 (E).
Lindesay, V. E. H., M.B. *1893* (E).
Lindsay, E. A., M.R.C.S. 1908 (E).
Lindsay, F. W., L.R.C.P. 1870 (I).
Link, O. C., M.B. 1914 (E).
Lishman, R. R., M.B. 1914 (E).
Litchfield, E. M., M.R.C.S 1915 (E).
Little, J. R., M.B. 1871 (E).

Lloyd, H. C., M.B. 1893 (I).
Lloyd, J., M.B. *1889 (E)*.
Locke, T. W. S., M.R.C.S. 1855 (E).
Lodge, Miss H., M.B. 1921 (E).
Loftus, M. J., L.R.C.P. & S. 1915 (I).
Logan, Miss M. E. M., L.R.C.P. & S. 1902 (I).
Loganadan, A. D., M.R.C.S. 1916 (E).
London, J. E., *M.R.C.S. 1883* (E).
Long, Mrs. N., M.B. 1913 (E).
Longson, F. M., M.B. 1905 (E).
Loudon, John, M.B. 1912 (E).
Loughran, D. J., M.B. 1920 (I).
Lovegrove, Charles, M.R.C.S. 1859 (E).
Lovegrove, Charles, L.R.C.P. 1881 (E).
Lowe, C. H., M.R.C.S. *1873 (E)*.
Lowe, P. R., *O.B.E.*, L.S.A. 1896 (E).
Lowne, B. T., M.R.C.S. 1861 (E).
Lubbe, W. P., M.B. 1917 (I).
Lubeck, W. J., M.R.C.S. 1896 (E).
Lucas, R. H., *O.B.E.*, *M.C.*, M.R.C.S. 1913 (E).
Luffman, W. *C.*, L.R.F.P.S. *1873* (E).
Lush, J. S., L.S.A. 1875 (E).
Lyden, M. A., L.R.C.P. 1881 (I).
Lyle, C. C. V., L.R.C.P. 1886 (E).
Lynch, J. A., M.B. 1916 (I).
Lynch, Stephen F., M.R.C.S. 1897 (E).
Lynch, W. W., M.R.C.S. 1901 (E).
Lyne, C. V. N., M.R.C.S. *1914* (E).

Maaz, M. F., M.R.C.S. 1910 (E).
Macabe, J. J., M.B. 1918 (I).
McAleer, James, L.R.C.P. & S. 1919 (I).
MacAlevey, G. E., *M.C.*, M.R.C.S. 1918 (E).
MacAlevey, W. C., L.R.C.P. *1877* (E).
McAlister, H. C., M.R.C.S. 1918 (E).
McArthur, A. N., M.R.C.S. 1895 (E).
McAuley, J. H., L.R.C.P. & S. 1884 (I).
McBurney, J. H., M.B. 1895 (I).
MacCabe, F. F., M.B. 1894 (I).
McCabe-Dallas, D. C., L.R.C.P. & S. 1907 (E).
McCarthy, C. W., L.R.C.S. 1872 (I).
McCarthy, Henry, L.R.C.S. *1889 (I)*.
MacCarthy, Philip, L.R.C.P. & S. 1908 (I).
MacCarthy, Randal, L.R.C.P. & S. 1892 (I).
MacCarvill, Patrick, M.B. 1917 (I).
McCausland, *J. E.*, *M.B. 1908 (I)*.
McCausland, S. R., L.R.C.P. & S. 1901 (I).
McCleland, H. A., M.R.C.S. 1893 (E).
McCombe, John, M.R.C.S. 1901 (E).
McConkey, J. T., L.R.C.P. & S. 1915 (I).
McCormack, W. J., L.R.C.P. & S., 1906 (I).
McCullagh, C. H. W., M.B. 1897 (I).
McCullagh, J. T., M.B. 1914 (I).
McCulloch, Miss E. E., M.R.C.S. 1921 (E).
McDermott, Bryen, M.R.C.S. 1912 (E).
McDonagh, G. R., L.R.C.P. 1877 (E).
McDonagh, J. M., L.R.C.S. 1882 (E).
Mc*Donagh*, *J. E.*, M.B. *1921 (I)*.
McDonald, Edward, M.B. 1897 (I).
McDonald, T. S., M.B. 1917 (I).
MacDonell, James A., M.B. 1882 (E).
McDonnell, Charles, L.R.C.P. & S. 1913 (I).
MacDonnell, Henry C. B., L.R.C.S. 1860 (I).
McDonnell, Joseph, L.R.C.P. & S. 1864 (I).
McDonnell, N. J., M.D. 1884 (I).
McDonnell, P. M., M.B. 1920 (I).
MacDonogh, J. D., L.R.C.S. *1885 (E)*.
McDonough, P. H., L.R.C.P. & S. 1912 (I).
McDougall, Richard, M.B. 1873 (E).
McDougall, Wm., M.B. 1897 (E).
McDowell, S. E. C., L.R.C.P. 1886 (E).
McElwee, Daniel, M.B. 1920 (I).
McEnery, W. A., M.R.C.S. 1900 (E).
McEntire, R. G. J., M.B. 1912 (I).
McEvedy, P. F., M.R.C.S. 1906 (E).
McGann, Michael, L.R.C.P. & S. 1893 (E).
McGottigan, John, M.B. 1917 (I).
McGuire, Miss Alice, M.B. 1921 (I).
McGuire, *Michael*, M.B. 1911 (I).
McGuire, W. G., L.R.C.P. & S. 1911 (I).
McGurk, D. J., M.B. 1919 (I).
McHale, P. J., L.R.C.P. & S. 1895 (I).
McIlroy, P. T., M.R.C.S. 1920 (E).
Mackay, Henry, M.B. 1889 (E).
McKay, James, *M.C.*, M.B. 1915 (I).
McKee, J. T., L.R.C.P. & S. 1910 (I).
McKee, J. W., M.B. 1917 (I).
McKee, William, M.B. 1907 (I).
Macken, Hubert, M.B. 1918 (I).
McKendry, T. T., M.B. 1894 (E).
McKenna, Miss M. C., M.B. 1914 (I).
McKenzie, Archibald, M.B. 1883 (E).
Mackenzie, F. M., M.R.C.S. 1866 (E).
MacKenzie, J. R. M., *M.C.*, M.B. 1916 (I).
MacKenzie, W. *G.*, *L.R.C.P.* & S. *1877 (I)*.

Mackew, Samuel, M.B. 1881 (E).
Maclachlan, *R.* C., M.B. 1900 (E).
MacLaughlin, C. M., M.B. 1888 (I).
MacLean, C. M., M.R.C.S. *1906 (E)*.
McLean, W. W. L., L.S.A. 1886 (E).
MacLeod, A. D., L.R.C.S. 1886 (I).
McLeod, T. H., M.R.C.S. 1917 (E).
MacLoughlin, T. J., L.R.C.P. & S. 1878 *(E)*.
MacMahon, A. D., M.B. 1911 (I).
MacMahon, F. I., *L.A.H.* 1919 *(I)*.
McManus, George, L.R.C.P. & S. 1869 (I).
McMullen, John, M.B. 1893 (I).
McMurray, Wahab, M.D. 1881 (I).
Macnamara, D. W., M.B. 1918 (I).
Macnamara, G. F., L.A.H. 1884 (I).
Macnamara, G. U., L.R.C.S. 1871 (I).
Macnamara, Matthew, *L.R.C.S.* 1883 *(I)*.
McNaughton, Mrs. M. H., M.B. 1899 (E).
Macrae, Donald, M.R.C.S. 1908 (E).
McReddie, P. G., M.B. 1891 (E).
McRitchie, Philip, M.R.C.S. 1913 (E).
MacSweeney, J. A., L.R.C.P. & S. 1917 (I).
Madden, J. A., M.B. 1919 (I).
Madders, George, L.A.H. 1885 (I).
Madill, D. G., M.B. 1908 (I).
Maguire, Charles, M.B. 1920 (I).
Maguire, Daniel, L.F.P.S. 1876 (I).
Maguire, Joseph, L.R.C.S. 1886 (I).
Maguire, Stanislaus, L.R.C.S. 1876 (I).
Maguire, T. J. R., M.B. 1912 (I).
Major, H. M., M.R.C.S. 1903 (E).
Makar, Naguib, M.R.C.S. 1920 (E).
Makhijani, G. T., L.R.C.P. & S. 1915 (E).
Malaher, Bruce, L.R.C.P. & S. 1913 (I).
Malcolm-Gasper, R. J. T., L.R.C.P. & S. 1916 (E).
Malik. L. A., M.R.C.S. 1916 (E).
Malkani, S. S., M.R.C.S. 1916 (E).
Mallinick, Samuel, M.R.C.S. 1915 (E).
Mangan, Bartholomew, M.D. 1883 (I).
Mankar, B. S., L.S.A. *1897* (E).
Manker, V. L., L.R.C.P. & S. 1898 (E).
Manuel, Alexander, M.R.C.S. 1905 (E).
Marrack, G. C., M.R.C.S. 1898 (E).
Marriott, H. T., L.R.C.P. 1886 (E).
Marriott, Miss Phyllis, M.B. 1917 (E).
Marry, L. J. A., L.S.A. 1902 (E).
Marshall, F. E., L.S.A. *1896 (E)*.
Marshall, Joseph, M.B. 1876 (I).
Martin, H. P., M.R.C.S. 1905 (E).
Martin, J. H., M.B. 1900 (E).
Martin, J. M., M.R.C.S. 1899 (E).
Martyn, Ernest, M.B. 1881 (E).
Martyn, George, L.S.A. 1892 (E).
Mascarenhas, L. C., L.R.C.P. & S. 1912 (E).
Mason, H. W., L.A.H. 1902 (I).
Mason, R. P. S., *M.C.*, M.R.C.S. 1915 (E).
Massey, David, L.R.C.P. & S. 1898 (I).
Mathew, C. *P.*, M.R.C.S. 1883 (E).
Mathews, F. W., L.R.C.P. & S. 1908 (I).
Mathews, V. G., L.A.H. 1908 (I).
Mathie, J. P., L.R.C.P. & S. 1916 (E).
Mathur, K. P., M.R.C.S. 1911 (E).
Mattei, Charles, L.R.C.P. & S. 1898 (E).
Matthai, P. M., L.R.C.P. & S. 1897 (E).
Matthews, *T. M.*, *L.R.C.P.* & S. *1920 (I)*.
Maudsley, Henry, C.M.G., M.R.C.S. 1880 (E).
Maunsell, H. E., M.B., 1867 (I).
May, W. J., L.M.S.S.A. 1916 (E).
Mayberry, F. G., M.B. 1870 (I).
Maye, John, M.R.C.S. 1882 (E).
Mayer, C. A. L., M.B. 1906 (E).
Mayer, W. L., M.R.C.S. 1871 (E).
Meade, Edward, M.R.C.S. 1861 (I).
Meaden, C. A., M.R.C.S. 1909 (E).
Mellor, Thomas, L.S.A. 1878 (E).
Mellotte, *J. H.*, M.B. 1920 (I).
Menage, L. M. J., M.R.C.S. 1913 (E).
Menon, A. V. R., M.R.C.S. 1919 (E).
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Merrifield, S. S., M.R.C.S. 1883 (E).
Michell, Henry S., M.R.C.S. 1876 (E).
Michod, F. A. H., M.R.C.S. 1897 (E).
Miller, D. J., M.D. 1909 (I).
Miller, E. J., L.S.A. 1902 (E).
Mills, F. A., M.B. 1898 (E).
Milner, C. W., M.R.C.S. 1893 (E).
Milner, W. A., M.R.C.S. 1906 (E).
Milton, *A. R. O.*, M.R.C.S. 1892 (E).
Mistri, K. H., L.R.C.S. 1878 (E).
Mitchell, Edward, L.R.C.P. & S. 1920 (I).
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Mitchell, John, L.R.C.P. & S. 1910 (I).
Mitchell, John, L.R.C.P. & S. 1883 (E).
Mitra, Asutosh, L.R.C.P. & S. 1883 (E).
Mitra, B. M., M.R.C.S. 1914 (E).
Mittra, Dhanaindranatha, L.R.C.P. & S. 1899 (E).
Moftah, S. G., M.R.C.S. 1915 (E).
Molesworth, R. E., M.R.C.S. *1884* (E).
Molina, Ferdinand, M.R.C.S. 1915 (E).
Monckton, F. A., M.R.C.S. 1857 (E).
Monckton, H. H., L.S.A. 1897 (E).
Montgomery, Edward, M.B. 1891 (I).

Montgomery, H. H., L.R.C.P. & S. *1910* (I).
Moore, Alfred, M.B. 1892 (I).
Moore, A. R., L.R.C.P. & S. 1892 (I).
Moore, D. G. F., M.R.C.S. 1920 (E).
Moore, F. J., L.R.C.P. & S. *1902 (I)*.
Moore, G. S., L.S.A. 1899 (E).
Moore, H. E., M.B. 1904 (E).
Moore, J. B., L.K.Q.C.P. 1887 (I).
Moore, J. P., M.B. 1909 (I).
Moore, Walter, M.R.C.S. 1866 (E).
Moorhouse, B. M., M.B. 1883 (E).
Moran, T. F., L.R.C.P. & S. *1915 (I)*.
Moray-Lawrence, Miss J. M., M.B. 1909 (E).
Moreton, Frederick, M.R.C.S. 1894 (E).
Moreton, J. S., M.R.C.S. 1882 (E).
Morgan, C. P., L.S.A. 1891 (E).
Morgan, D. L., M.R.C.S. 1901 (E).
Morgan, H. L., M.R.C.S. 1907 (E).
Morgan, Mrs. M. E., M.B. 1913 (E).
Morgan, Thomas, M.R.C.S. 1902 (E).
Morley, Arthur, L.R.C.P. & S. 1885 (E).
Morrell, C. C., L.S.A. 1907 (E).
Morrin, F. J., M.B. 1915 (I).
Morris, E. W., M.R.C.S. 1887 (E).
Morris, Jonas, M.R.C.S. 1905 (E).
Morrow, Robert, M.B. 1884 (I).
Mortada, Ismail, M.R.C.S. 1915 (E).
Morton, F. W. W., L.R.C.P. & S. 1880 (E).
Moses, O. St. J., M.B. 1896 (E).
Moss, Miss *E. M. N.*, M.B. *1913 (E)*.
Mosse, C. G. T., M.R.C.S. 1915 (E).
Mostertz, Julius, L.S.A. 1893 (E).
Moxon, A. H., M.R.C.S. 1886 (E).
Mudd, F. B., M.R.C.S. 1897 (E).
Mullins, G. L., M.B. 1887 (I).
Munro, A. W., M.B. 1883 (E).
Murie, *James*, M.D. 1857 (E).
Murnane, Miss H. M., M.B. 1920 (I).
Murnane, J. I., M.B. 1913 (I).
Murnane, P. J., M.B. 1918 (I).
Murphy, A. E., L.R.C.S. 1886 (I).
Murphy, *H.* A. J. S., L.Med.L.S. 1900 (I).
Murphy, J. J., M.R.C.S. 1916 (E).
Murphy, L. *C.* E., L.R.C.P. & S. 1903 (I).
Murphy, Miss M. A., M.B. 1912 (E).
Murphy, P. F., M.B. 1911 (I).
Murray, A. H., L.R.C.S. 1880 (I).
Murray, Cyril, L.R.C.P. & S. 1917 (I).
Murray, *Miss* J. R., *M.B. 1906 (I)*.
Murray, *Joseph*, L.R.C.P. & S. 1902 (I).
Murray, Thomas, L.R.C.P. & S. 1910 (I).
Muttu Kumaru, K. V., M.B. 1915 (E).
Myerson, M. C., L.R.C.P. & S. 1918 (I).

Nagle, J. J., M.D. 1885 (I).
Nairn, A. B., L.R.C.P. & S. 1900 (E).
Nankivell, Frank, M.B. 1875 (E).
Naoroji, M. A. D., M.B. 1906 (E).
Nariman, B. K., M.B. 1896 (E).
Naz, J. B. C. O., M.R.C.S. 1899 (E).
Neill, *Charles*, M.B. 1894 (E).
Neligan, A. R., M.R.C.S. 1903 (E).
Neville, Thomas, L.R.C.P. & S. 1898 (E).
Newman, C. D., M.B. 1920 (E).
Newmark, Solomon, L.R.C.P. & S. 1903 (E).
Nicholls, John M., M.R.C.S. 1880 (E).
Nicholson, Gerald, M.R.C.S. 1881 (E).
Nicholson, John, M.R.C.S. 1862 (E).
Nicol, Wm. P., M.R.C.S. 1896 (E).
Nicol, Wm. Robert, L.S.A. *1891 (E)*.
Nielsen, Fredk. W., L.S.A. 1885 (E).
Nihill, *John E.*, M.R.C.S. 1886 (E).
Nissim, Edward, M.R.C.S. 1918 (E).
Noad, Ernest, M.R.C.S. 1884 (E).
Nolan, Harold, M.B. 1896 (E).
Nolan, Herbert F., L.R.C.P. & S. 1894 (I).
Noonan, *Patrick*, L.R.C.P. & S. 1892 (E).
Norman, Cuthbert E. R., L.A.H. 1912 (E).
Norrington, H. L. W., *D.S.O.*, M.R.C.S. 1897 (E).
Norris, Miss Nannette, M.B. 1921 (I).
Nortje, *Peter Le F.*, M.B. *1911* (E).
Nottingham, Wm. A. J., L.S.A. 1885 (E).
Noyes, Alexr. W. F., L.S.A. 1885 (E).
Nuthall, Robert L. S., M.R.C.S. 1890 (E).

Oates, James *C.*, M.R.C.S. *1900* (E).
O'Brien, James V., L.R.C.P. & S. 1915 (I).
O'Brien, Michael F., L.R.C.P. & S. 1918 (I).
O'Brien, Michael J., L.R.C.P. & S. *1894* (I).
O'Carroll, Martin, L.Med.U.Dubl. 1875 (I).
O'Connell, Patrick Joseph, L.R.C.P. & S. 1918 (I).
O'Connor, James, M.B., 1914 (I).
O'Connor, Matthew J., M.B. 1919 (I).
O'Connor, Wm. M. J., M.B. 1914 (I).
O'Donnell, John, M.B., 1892 (I).
O'Donnell, Thomas M., L.R.C.S. 1883 (I).
O'Donoghue, Henry V., L.R.C.P. & S. 1914 (I).
O'Donovan, Daniel, M.R.C.S. 1919 (E).

O'Donovan, Louis J., L.R.C.P. & S. 1912 (I).
O'Donovan, Wm. J., *O.B.E.*, M.R.C.S. 1909 (E).
O'Driscoll, John A., L.R.C.P. & S. 1914 (I).
O'Driscoll, John P., M.B. 1914 (I).
O'Dwyer, Peter, L.R.C.P. & S. 1888 (I).
O'Farrell, Ignatius, L.K.Q.C.P. 1860 (I).
O'Farrell, John W., L.R.C.P. & S. 1908 (I).
O'Flynn, Jerome, M.B. 1913 (I).
O'Grady, John F. G. K., M.B. 1921 (I).
O'Grady, Patrick J., M.B. 1913 (I).
O'Hagan, Charles, M.B. 1914 (E).
O'Halloran, Miss A. M. K., M.B. 1917 (I).
O'Keefe, Edward J., M.B. 1914 (I).
O'Kelly, James J., M.B. 1909 (I).
O'Kelly, John J., L.R.C.P. & S. 1912 (I).
O'Leary, James, L.R.C.P. & S. 1900 (I).
O'Leary, Miss M. M. A., M.B. 1915 (I).
Oliver, A. C., L.S.A. 1901 (E).
Oliver, Charles H., L.R.C.P. & S. 1911 (I).
Olivey, Wm. J., M.R.C.S. 1891 (E).
Olsen, Alfred B., M.R.C.S. 1901 (E).
O'Malley, Michael, M.D. 1868 (I).
Omar, Mustafa A., M.R.C.S. 1916 (E).
O'Meara, Daniel J. P., M.R.C.S. 1920 (E).
O'Meara, Patrick M., M.B. 1897 (I).
O'Neill, John G., M.B. 1878 (I).
O'Neill, Wm., M.B. 1914 (I).
O'Reilly, Miss Alice, M.R.C.S. 1916 (E).
O'Reilly, Arthur E., L.R.C.P. & S. 1900 (I).
O'Reilly, Charles J., *D.S.O.*, *M.C.*, M.B. 1913 (I).
Orford, Miss Florence, L.R.C.P. & S. 1888 (E).
O'Riordan, George E., M.B. 1919 (I).
Ormsby, George H., L.K.Q.C.P. 1869 (I).
Orr, Andrew W., M.B. 1887 (I).
Orr, Frederic L., M.B. 1890 (E).
Osburne, John C., M.B. 1913 (I).
O'Shaughnessy, Michael, L.R.C.P. & S. 1890 (E).
O'Shaughnessy, P. J. B., L.R.C.S. 1878 (I).
O'Sullivan, C. F. X., M.B. 1907 (I).
O'Sullivan, David, L.R.C.P. & S. 1909 (I).
O'Sullivan, Edward F., M.D. 1897 (I).
O'Sullivan, James J., L.R.C.P. & S. 1921 (I).
O'Sullivan, Joseph E., M.B. 1913 (I).
Othman, Ahmed, M.R.C.S. 1920 (E).
Owens, Edward M., M.R.C.S. 1866 (E).
Owens, Henry E., M.B. 1916 (I).

INTERNATIONAL UNIFORMITY IN PHARMACOPŒIAL PREPARATIONS.

SOME NEW SUGGESTIONS.

THE problem of an International Pharmacopœia was discussed at the general assembly of the International Pharmaceutical Federation, which met in London recently at the same time as the British Pharmaceutical Conference.

The subject is not a new one, and we may recall that already, in 1877, at the Fifth International Medical Congress of Geneva, following a report from Dr. Gilles, it was agreed that uniformity both in the nomenclature and the composition of medicaments was highly desirable. A committee was appointed to study the subject and to inquire into the matter of a universal codex which had been prepared by the Société de Pharmacie, of Paris. At the next Congress (Amsterdam, 1879) this committee was enlarged, and it was decided to accept the French draft as a basis and have it published. The French formulary, however, passed through many vicissitudes and was never set in print. In 1881 the Seventh Medical Congress met in London at the same time as the Fifth Pharmaceutical Congress. They had a joint meeting, and after a long discussion two committees were appointed, one by each body, to collaborate and prepare a restricted formulary that would receive general approval. The Pharmaceutical Committee published the result of its labours in 1885 (Sixth Congress, Brussels), but it remained a dead letter.

Once more, at the Moscow Medical Congress of 1897, the question was raised and a proposal put forward to find a Government that would give its support to the undertaking. During the year following the Brussels Academy of Medicine requested the Belgian Government to convene a representative international conference for the purpose of standardising potent galenicals. The conference met in 1902 and yielded the first practical result in the form of an international agreement regulating the strength of some 40 poisonous preparations. Since then very little advance has been made, but the International Pharmaceutical Federation has recently decided to renew the attempts.

Prof. van Itallie (Leiden), in his presidential address to the Federation, remarked that the Brussels agreement, though an excellent beginning, has become antiquated and, like every national pharmacopœia, requires corrections and extension. As President of the Pharmacopœia Committee of Netherlands, he was fully aware of the large amount of work necessary for its revision. He had, therefore, proposed last year that an international secretariat should be entrusted with the task of collecting the data needed for bringing up to date national pharmacopœias, thus promoting uniformity. A committee of chemists, pharmacologists, clinicists, and serologists could afterwards compile an international pharmacopœia of a restricted scope, containing only the more important drugs and their preparations, together with accurate methods of testing. The need for national medicines would still exist, but every country would be free to have its own additional formulæ. In most places we find already side by side an official pharmacopœia and a national formulary.

Dr. J. J. Hofman (Secretary of the I.P.F.) stated that the Belgian Government had been requested to bring together a second international conference in order to discuss the institution of a central pharmacopœial secretariat as outlined by Prof. van Itallie. The Belgian Government had not yet signified its acquiescence, and if it should refuse another Government will have to be approached.

A slightly different proposal was put forward by a group of British pharmacists and analysts, who communicated to the Conference a number of monographs dealing with the international standardisation of pharmacopœial preparations. Mr. V. Cofman, B.Sc., in introducing these papers, explained that they had put aside, for the time being, the ambitious aim of an international pharmacopœia. The immediate aim was to attain uniformity in the case of the really important drugs, so that potent preparations which had a common name in different countries should also have the same composition. The importance of this step was too obvious to need demonstration; everybody was agreed on that point. Of greater importance was the method chosen to attack the problem. In their opinion it was necessary to prepare the ground by collecting in a convenient form the data on which the international conference for unification, when it eventually does meet, will have to base its decisions. A beginning in this field had been made. Each monograph submitted to the Conference dealt exhaustively with a single drug and its preparations giving comparative tables of the formulæ and methods adopted by all existing pharmacopœias, together with criticisms and suggestions as to which appears the most suitable for universal use.

Mr. C. T. Bennett, B.Sc., F.I.C. (Chief Chemist, Wright, Layman and Umney), who had investigated the cinchona preparations and the methods of assay of various pharmacopœias, came to the following conclusions: (1) that the bark should be required to contain 6 to 8 per cent. of total alkaloids; (2) that a liquid extract should be prepared by percolation with 70 per cent. alcohol, hydrochloric acid and glycerine being added to prevent precipitation (its alkaloidal content should be 5 per cent.); (3) a simple tincture (1 per cent. alkaloids) should be prepared with 70 per cent. alcohol.

Mr. H. B. Stevens, O.B.E., F.I.C. (Director, John Bell, Hills and Lucas), dealt in his monograph with the opium preparations, and advised that: (1) in expressing the percentage of alkaloid present the morphine should always be calculated as anhydrous; (2) the extract of opium should contain 20 per cent. of anhydrous morphine, sugar of milk being used as diluent, if necessary; (3) the tincture of opium be made with 45 per cent. alcohol, 70 per cent. being unnecessarily high; (4) the formula for Dover's powder should be: opium 1, ipecac. 1, sugar of milk 8.

Mr. A. J. Jones, Ph.C. (Research Dept., Evans, Lescher and Webb) reviewed the preparations of belladonna, showing the present variations in the formulæ and methods of testing. The author suggests that a soft standardised extract should be retained, and describes the analytical methods which appear most reliable for determining the activity of the drug.

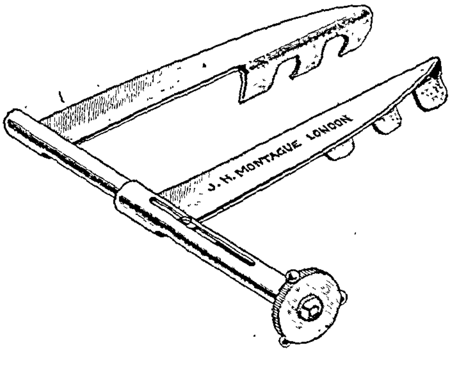
Messrs. J. Cofman-Nicoresti and S. B. Tallantyre, B.Sc., A.R.C.S. (City Laboratories) gave a survey and critical description of the quillaia preparations, while a study of colchicum galenicals from an international standpoint came from Misses E. Hooper, B.Sc., F.I.C., and K. M. King, Ph.C. (Principals of the School of Pharmacy for Women.)

It was finally recommended that the faculties of medicine and pharmacy of every country should be advised to continue and extend this essential preliminary work, and when all the information needed had been collected the Health Department of the League of Nations should be asked to bring together a conference of those concerned, in order to decide which formulæ and methods are most suitable for universal use. The assembly agreed that the permanent committee should consider the proposal and take the necessary steps accordingly.

New Inventions.

A LAMINECTOMY RETRACTOR.

ONE of the difficulties in performing a laminectomy operation is to obtain adequate retraction of the erector spinæ muscles on each side. If the muscles are peeled away on either side and a self-retaining retractor inserted, an excellent view of the laminæ is obtained, and troublesome hæmorrhage is avoided. The retractor consists of two stout steel blades with wide base and tapering towards the top. The inner edges of the blades have three curved hooks which are inserted under the erector spinæ muscles when the retractor is closed. The extension of the retractor blades are manipulated by a quick travelling screw revolving in a telescopic steel tube. On rotating a wheel at the opposite end of the tube, the blades will open to 5 inches. I have found the retractor a very useful instrument; the adjustment is good.



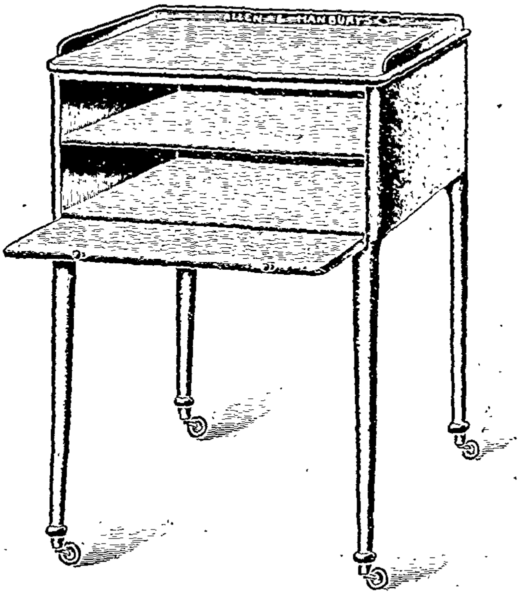
Messrs. J. H. Montague, of 69, New Bond-street, London, W., have made the retractor here described to my design.

C. P. G. WAKELEY, F.R.C.S. Eng.

Devonshire-place, W.

INVALID'S BEDSIDE TABLE.

THIS table has been designed to add to the comfort of those patients who are not helpless, but have to spend many hours in bed. The ordinary table soon becomes crowded with the patient's effects, and everything is displayed to anyone entering the room. The table illustrated is in three tiers: the top and two compartments, and in addition there is a sliding shelf which can be pulled across the bed. It takes up less room than the ordinary small table in use for the purpose, and it has the following advantages: The two compartments will hold all the personal belongings, such as books, writing materials, and so on, which any one is likely to need, and these are in sight and control only of the patient, and are always easy to get at. Spit cups, medicine bottles, and so on, are kept out of sight of everyone except the occupant of the bed. The sliding shelf pulls over the bed for meals or for writing upon, and there is no need for bed-tables of any kind.



The table runs on easy castors, and a slight push will place it in any desired position. All corners are rounded. It can be made of any hard wood, and polished so that it forms an attractive feature in a sick-room.

The table is made by Messrs. Allen and Hanburys, Ltd., Wigmore-street, London, W. 1.

A. CAMPBELL STARK, M.B. Lond.

Wanstead Park, E.

EAST SUSSEX HOSPITAL.—On July 23rd Viscount Goschen presided at the annual meeting of the recently opened East Sussex Hospital. In the course of his speech Lord Goschen spoke of the anxiety on his own part and that of his audience to preserve the system of voluntary hospitals, and of the spirit of voluntary service and self-sacrifice which, he was convinced, was needed at the present day perhaps more than ever, and which beside assisting hospitals, would assist the country during times of anxiety and unrest. The greater the advance in hospitals the greater must the expense be, but a business man would look at the return the country was getting for this insurance against a C3 population. Lord Goschen recalled that the foundation-stone of the hospital was laid in 1914, a fortnight before the outbreak of war. The hospital had, however, only just been completed. The annual meeting this year had been delayed to allow of it being held in the new building. The annual report, of course, referred to the work at the old building at White Rock. It showed that the number of in-patients during the year was 1011, and new out-patients (including 1171 casualty cases) 4681. The general income had been well maintained, there being an increase of £183 upon the ordinary income, the total being £13,817. The annual subscriptions showed an increase of £273, the total received from subscribers being £2326. The ordinary expenditure showed a considerable drop; an overdraft at the bank had been liquidated, and the balance sheet showed a deficit of £145 18*s*. 5*d*. The reserve was put at £14,419. The report chronicled the purchase of houses for a nurses' home, the gift of the chairman of the committee, Major W. H. Mullens, J.P. In recording the resignation of Dr. C. Christopherson, senior surgeon, owing to illness, after a period of 29 years' service, the report stated that "It is largely due to his ability, influence, and personality that the East Sussex has obtained its reputation for efficiency." In the discussion on the report it was said that roughly another £10,000 was needed to complete the work, with an additional sum of £1500 or £2000 for furniture and equipment.

THE LANCET.

LONDON: SATURDAY, AUGUST 11, 1923.

EXOPHTHALMIC GOITRE.

The present issue of The Lancet contains two articles on the treatment of exophthalmic goitre which are to some extent complementary. In one Dr. G. R. Murray describes the treatment of the disease by medical measures; in the other Mr. A. J. Walton deals with it rather from the surgical standpoint. The articles, however, although complementary, exhibit in a remarkable way the necessity for intimate coöperation between physician and surgeon in treating this condition. An immense amount of thought has been given to the attempt to elucidate the ætiology and treatment of the disease, and the literature of the subject is profuse; but it must be confessed that the problem of ætiology is still unsolved and that treatment, whether medical or surgical, remains almost exclusively symptomatic. But with admission of this fact and of its corollary that surgery may eventually come to occupy a very minor place in the treatment of exophthalmic goitre, yet it must also be granted that by far the most striking advances during the last 15 years have been made along the lines of surgical intervention. The foundations of the requisite knowledge and experience have been carefully and painfully laid by the pioneer work of Dunhill in Australia, of Crile and the Mayo brothers in America, and of Berry and Walton in this country, and the results have been gratifying to surgeons and patients alike. Surgery in the course of its advance has met with much healthful opposition, but it has proved its worth; and this claim is substantiated by the attitude of an authority such as Sir Hector Mackenzie, who, having been in full opposition ten years ago, is now one of the convinced supporters of surgical treatment.

Even apart from the relative claims of medicine or surgery as regards ultimate success, one of the chief factors lending its weight in favour of surgery is the comparative rapidity with which improvement is obtained. The period of the patient's disability is measured by months rather than by years, and the paradoxical fact remains that surgical treatment, although symptomatic, produces a large proportion of apparent cures. These results have, however, only been obtained by the closest attention to every detail of the procedure. There can be few surgical operations requiring more careful preparation, closer watching of the operative conditions, including even the state of the weather, or more precise operative technique. All these points receive attention in Mr. Walton's lecture, though the limits of a single article, while not preventing him from considering the disease from the widest possible point of view, have not permitted him to enter fully into the more technical details. Opposition to surgical treatment was formerly based largely on the operative mortality, but this has now been reduced to a point at which statistics cease to have much importance. It may be assumed that the operative mortality is now in expert hands not greater than 5 per cent. A claim made by any individual operator to a reduction to a figure below 3 per cent. possibly depends upon whether he is operating with a view to favourable operative statistics or solely for the welfare of the individual patient. When a risky operation forms the patient's only hope of recovery great moral courage may be needed by the surgeon in forming the decision whether the operation is justifiable or not. However this may be, there is a very general agreement among surgeons and physicians that medical treatment should be tried for at least six months in almost every case before any operation is performed. This six months' trial is necessary both as a test of the value of drugs and general measures in each case, and as a preparation for operation if this is eventually to be advised.

On these points controversy is now almost at an end. Difference of opinion still exists, however, regarding the value of treatment by X rays. Dr. Murray regards this as "one of the most reliable means" of treatment we possess; Mr. Walton has found its use "very unsatisfactory," and supports the view that radiation has little or no effect on the thyroid by the observation that he has found no appreciable change in the thyroid of those cases that he has operated upon after X rays had been tried. The general trend of opinion seems to be against a belief in the efficacy of X rays, but this is a matter upon which no final opinion can be expressed. It has long been observed that the changes in the thyroid are accompanied by an enlargement of the thymus gland; this was noticed and recorded 100 years ago by Sir Astley Cooper. But little attention has been given as yet to the effects of radiation upon the thymus which, consisting as it does chiefly of lymphoid cells, might be expected to be more readily affected than the thyroid itself. The whole problem of exophthalmic goitre is a fascinating one, whether regarded from the ætiological, pathological, medical, or surgical standpoint. Every one of these aspects may undergo a sudden and complete change in the near future. The articles now published will at any rate mark the place which had been arrived at in the year 1923.

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PHYSICAL RESEMBLANCE IN CASES OF DISPUTED PARENTAGE.

In the Russell *v.* Russell divorce proceedings, which seem likely to give the House of Lords the opportunity of dealing with more than one point of medico-legal interest, the child was brought into court, and the jury was invited to draw an inference as to its paternity from its resemblance or non-resemblance to photographs of the petitioner taken at a similarly early age. "I cannot stop your considering this question of likeness," said Mr. Justice Hill to the jury, "but I myself regard it as a dangerous guide." The fancifulness of family opinions on suggestions of family likeness is indeed notorious, and the fallibility of partisan belief was manifested in the Russell case, when the respondent was incautiously ready, under a confusing cross-examination, to find a resemblance between her baby and the photograph of a total stranger. Lady Ampthill, the petitioner's mother, declared that the child in court bore no resemblance to her son, but negative evidence in itself is of but slight assistance. Likeness may be some aid in establishing paternity; unlikeness is none. It may be possible to draw attention to an aggregate of similarities—the colouring of the eyes or the hair, the shape of the ear, and so on; but evidence of this kind in courts of law is hardly developed with as much certitude as evidence of identity in hand-writing—a study in which expert witnesses have come sadly to grief before now. General likeness of feature is not uncommonly relied upon in affiliation proceedings, wherein magistrates, we believe, allow it a certain minor corroborative value in a rough and ready sort of way. One would suppose it was an especially dangerous guide in such cases, since the woman is usually making her application to the court at a time when the infant is of so tender an age that immaturity of feature must obscure observation and discount confidence. Much more significant than mere resemblance of feature would be any evidence of some definite hereditary characteristic. If the study of blood-groups yields as yet no very positive result for medico-legal purposes,[1] the recurrence of a malformation might assist decision. Twenty years ago, in a Jamaican case, polydactylism was relied on as an inference of family descent.[2] Racial characteristics would also be of value. A coloured skin and woolly hair would be by no means negligible if there were an allegation of negro paternity. Even in Scotland, where this kind of evidence of physical resemblance is not normally permitted, notice has been taken of such points; for instance, in a case 100 years ago a white man was held not to be the father of a white woman's child, the child being a mulatto.

Those who are interested in this point of medical jurisprudence will find a singularly lucid and informing article by Prof. COURTNEY KENNY in our learned contemporary the *Law Quarterly Review*, entitled Resemblance as Evidence of Consanguinity, wherein these matters are admirably set forth. The writer traces the doctrine of the acceptability of such evidence back to the famous Douglas Cause of 1769, the most sensational litigation of its time, a topic on which BOSWELL wrote a pamphlet which he could never induce Dr. JOHNSON to read. In the House of Lords, Lord MANSFIELD, enlarging upon the greater scope for drawing helpful inferences from physical likeness amongst human beings than in the rest of the animal world, said "a man might survey 10,000 people before he saw two faces perfectly alike," while CAMDEN, then Lord Chancellor, in language more rhetorical than judicial, spoke of the physical likeness in the case as "an impression stamped by God himself to prove the legitimacy of the child." In 1915, it may be recalled, evidence of this kind was tendered in the Slingsby case, when an action was brought in the name of a boy of 4 years of age, asking that he be declared the lawful child of Commander SLINGSBY, who supported his claim as against certain relatives who were hostile to it. The judge, Sir BARGRAVE DEANE, then took the unusual course of obtaining the services of Sir GEORGE FRAMPTON, the well-known sculptor, to assist him in the comparison of the features. The judgment, which was in favour of the boy's legitimacy, dwelt upon his extraordinary likeness to Commander SLINGSBY. Both the Court of Appeal and the House of Lords were prepared to allow weight to the judge's own opinion of the likeness, though the calling in of the sculptor, who had neither been sworn as an expert witness nor formally appointed as an assessor, was thought irregular.

Thus, after a long series of decisions it has become clear that the English law, cautiously and for what the evidence may be worth, allows testimony of physical resemblance in disputes about parentage. In a well-known text-book of high authority—TAYLOR on "Evidence"—it is suggested that this legal position is automatically reached as soon as it is proved to the court as a matter of science that children are apt to inherit the features of their parents. In criticising this statement Prof. KENNY points out that there is no case on record wherein the courts have required any such preliminary proof of the general principle. Judicial ignorance, nowadays perhaps less overworked than formerly, is not so blindfold as that. As Prof. KENNY observes, "Tribunals sufficiently familiar with the course of nature to be able to take judicial notice that a woman of 70 will have no more children, and that a husband's non-access for a year disproves the legitimacy of his wife's child, will need no aid from scientific witnesses to assure them that 'Like is apt to beget like.'"

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THE MECHANISM OF ALIMENTARY SECRETION.

A GLANCE at recent work in physiology reveals a number of highly critical publications on the subject of alimentary hormones. After the introduction of gastric and pancreatic secretin some years ago the hormonic theory of secretory stimulation seemed to take an assured position in physiology, at least in this country.* Very little work on similar lines appeared until quite recently; perhaps the work of IVY should be mentioned first, since he repeated a great deal of EDKINS's work, which he failed to confirm, and came to the conclusion that gastric secretin was not the normal method of producing a secretion from the stomach. With regard to the question of pancreatic secretin, there is abundant confirmation of the fact that an injection of an extract of duodenal mucosa does cause a secretion from the pancreas. The doubt arises as to whether this is the normal mechanism of pancreatic secretion, for there seems to be a gap in the logic at this point. It will be remembered that BAYLISS and STARLING stated that many substances were capable of producing secretin, but that HCl was by far the most potent and important. DAMADE and DE GRAILLY, in a paper on duodenal tubage read recently before the Société de Biologie,[1] give the results obtained by the injection of substances directly into the duodenum. They passed a duodenal tube on the starving subject, and aspirated as much fluid from the duodenum as possible. They then injected various test fluids into the duodenum through the tube, and withdrew specimens of the resulting secretion at quarter-hourly intervals. These specimens were measured and were analysed for bile, lipase, trypsin, and titratable alkalinity. The observers experimented with milk, skimmed milk, olive oil, and a solution containing HCl and peptone. They found that olive oil and milk increased the volume and the enzyme content to a very marked extent, whilst hydrochloric acid appeared to be without action. In some of the experiments olive oil doubled both the volume and the concentration of the constituents of the secretion. The conclusions to be drawn from the experiments is in direct opposition to the popular conception of the secretin hypothesis, which holds hydrochloric acid to be far the most powerful of secretin producers. The problem of pancreatic stimulation in achlorhydria is brought to mind. Similar results were obtained by BENNETT and DODDS, who used the respiratory method of recording secretion below the pylorus. These workers showed that there was no difference in the effect on pancreatic secretion when acid or alkaline fluids were introduced into the duodenum. Unfortunately, it is practically impossible to devise any method of investigating secretion below the pylorus in which the sources of error are fairly low. Direct tubage of the duodenum is open to more fallacies than tubage of the stomach, since the contents at any particular moment are influenced by so many rapidly varying factors—namely, entrance of stomach contents, bile, pancreatic and duodenal secretions, together with the more or less rapid passage of the resultant mixture through the duodenum. The last ten years have seen considerable advances in the study of human digestion, and as more physiological research is done with normal men as subjects it becomes more and more apparent that a large number of the text-book views on digestion—based on animal work—are quite inapplicable to man.

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[1] See Blood-groups and Paternity, THE LANCET, 1922, ii., 285.

[2] THE LANCET, 1903, i., 822.

[1] Tubage duodénal: rôle de quelques excitants chimiques de la sécrétion duodénale, Comptes Rendus de la Société de Biologie, June, 1923.

Annotations.

"Ne quid nimis."

PRESIDENT HARDING.

THE late President Harding, whose death occurred with tragic suddenness as he was apparently on the high road to recovery from an attack of bronchopneumonia, came of a medical stock. His father, George Tryon Harding, is still in practice at Marion, a township of 29,000 inhabitants in Ohio, where the President was born and brought up. Dr. Harding is now in his seventy-ninth year, having qualified at Cleveland University in 1873. A younger brother of the late President bears his father's name and is in practice at Columbus, a city of 240,000 in the same State; he qualified in 1900 at the Ann Arbor University of Michigan and is a specialist in neurology and psychiatry. It is not fanciful to see in the late President's broad outlook some reflection of the medical atmosphere in his early home life.

INDUSTRY AND HEALTH.

MANY influences are pointed to when reason is sought for the steady improvement which has taken place since the middle of last century in the health of the nation. Improved sanitation, better housing, pure water-supply, rise in value of real wages with better feeding, less intemperance, better care of the individual and by the individual due to better education—all are credited with their contribution; but here and there authorities such as Greenwood have stressed the importance of improved conditions of labour brought about partly by natural progress as industrial methods have developed, but more directly by compliance with our code of factory legislation. Few persons are in a position to judge of the progress, since few are familiar with the insides of our great factories. There exists, however, a body of expert inspectors always at work pressing for and obtaining improvements; probably it constitutes the most effective branch of the public health service. It is formed of two groups, inspectors of factories and inspectors of mines.

We have before us, just published, the annual report of the Chief Inspector of Factories,[1] which tells of the work done during the past year. Signs are reported of a turn in the industrial tide and of opportunities being taken to prepare for future development. The tendency continues for larger establishments to increase in number and size while the smaller workshops get fewer—a movement advantageous to improved conditions of work. The report consists of four chapters in which information is given of the more striking events of the year and of steps taken to administer the law and obtain compliance with the various codes of regulations: then follow three chapters dealing with special investigations, one into the dust content of the atmosphere of workplaces, another concerned with physiological costs of different methods of weight-carrying, and the third with dangers from explosions on oil-carrying and oil-fuel ships. We note with appreciation that the factory department is carrying out such work. The time has gone by when advances in industrial legislation can be based upon "a general consensus of opinion": the obviously injurious matters are under control. Only by accurate knowledge based on careful research can further pronounced progress be effected. The work of Dr. E. L. Middleton is a good instance in point, since he has been able to advance knowledge concerning the type and size of dust particles inhaled and the kinds of symptoms and invalidity which follow. This knowledge should allow action to be concentrated upon the most injurious types of dust. Somewhat unfortunately for the reader the presentation of Dr. Middleton's research has been divided up; one part appears in the present report and deals with the dust present, the other part, concerned with his clinical findings and physical examinations, has just appeared in a separate report.[2] The reason for this separation is obscure. Dr. E. E. Hewitt's research into weight-lifting is another valuable piece of work. Here is a subject about which much has been said, but little really is known. At last, by appeal to the laboratory and to experiment, the foundations have been laid of useful information as to the energy-cost of labour and to the degree to which this cost can be modified by method.

The work of the medical staff is told of by Dr. T. M. Legge, especially with reference to the control of different forms of industrial poisoning, of which plumbism receives most attention; the cases for the year numbered 247, as compared with 639 in 1902. The international aspect of industrial health is borne evidence to by an inquiry conducted into photo-engraving for the International Labour Office, part of a more general inquiry conducted in several other countries,[3] concerning which it is sufficient to note that the danger from nitrous fumes is recognised and under control in this country.

AN IRISH POOR-LAW HOSPITAL SCHEME.

THE first annual report covering the year ended March 31st, 1923, of the County Galway Board of Health is addressed to the Minister for Local Government, President Cosgrave, who was himself responsible for the order, "Abolish the Unions." Mr. Cosgrave writes in a foreword to the report:

> "It has been well and truly said that kindly care for the poor is the best sign of true civilisation, and, again, that the condition of a nation's poor indicates the character of the national mind. With the coming of Freedom the people of County Galway were quick to realise that, at last, it was in their power to end for ever the contemptuous treatment of the poor resulting from the workhouse system, and they set about inaugurating a new system with energy and zeal. I have great hope that, in County Galway and throughout the Free State, the new schemes, established for the better relief of the poor and the better care of the sick, will be administered prudently and humanely, and that these schemes will win for themselves the confidence of the people. Let us hope that true kindly charity may spring from the good fortune on which, we believe, our country is entering."

The report states at the outset that the whole "workhouse" system was inherently bad and would appear to have been designed to put poverty and misery and vice conveniently out of sight rather than to relieve or comfort or retrieve. A history is given of the ineffectual attempts to amalgamate the unions, beginning in August, 1899, and culminating in the County Council Order of October, 1921, appointing the County Board of Health with instructions to abolish the unions and to set up one central county hospital, one central county home, a home for children and unmarried mothers, and to arrange for the care of other classes of persons chargeable to county rates. The Board of Health worked at high pressure, and within eight weeks, by the middle of December, the unions of County Galway had gone for ever without any sworn inquiries, without any expenditure on evidence, and without even a sealed Order.

The central hospital is located at Galway, the county home at Loughrea, and the Board have made arrangements with the Bon Secour sisters to take charge of the children's home, for which the Glennamaddy Union Buildings have been utilised. Thirty per cent. of the customers of the workhouses disappeared when asked to move, a proportion of whom will probably become recipients of home assistance. Appointments have been made as far as possible from existing staffs, so as to avoid compensation. The claims of 206 disemployed officers have been considered. Much union property has been lost through burning. Home assistance (formerly outdoor relief) is to be all in kind and not in cash. A medical and surgical staff has been appointed for the hospital. The question of "paying patients" gives trouble, and it is difficult to obtain payment from every patient who is able to pay. The salary of the medical officer of a full dispensary district has been fixed, temporarily, at £300 per annum and of a dispensary midwife at £52. The new county home at Loughrea is an attempt to bring comfort and happiness into the lives of the inmates, who have comfortable dining and recreation rooms and dormitories, games and grounds for pleasant exercise—in fact, a great contrast to the old typical workhouses. The Board are confident that the children's home, placed in charge of the Bon Secour sisters, will prove a valuable addition to the social service machinery of the county, and the necessary reconstruction to put it into an efficient condition is now receiving attention. For harmless lunatics and epileptics the county unit is too small and a provincial institution will be the probable solution. From an economic point of view the changes have resulted in the reduction of the annual demand on the ratepayers from £102,000 (March, 1921) to £59,000 (March, 1924). Economy is not the most important consideration, and the Board claim that, although much requires to be done, they have already achieved a fair measure of success in securing better care for the old and infirm and for the sick, and more kindly thought for the shelter and retrievement of the unfortunate.

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[1] Annual Report of Chief Inspector of Factories for 1922. H.M. Stationery Office. [Cmd. 1920]. 1923. Pp. 153. 5s.

[2] Report on Grinding of Metals and Cleaning of Castings and the Effects of Dust Inhalation upon the Workers E. C. Macklin and E. L. Middleton. H.M. Stationery Office. 1923.

[3] Dangers to Health in Photo-Engraving, International Labour Review, vol. iii., No. 1, pp. 116–125.

The Galway Board of Health have made an energetic start, and all social reformers must heartily wish them success. It may be that just as our farmers go to Ireland to learn about coöperation we may shortly be sending deputations there to learn how to deal with the long overdue changes needed in our Poor-law system.

SPLENIC ANÆMIA.

Dr. William C. Chaney[1] has devoted his thesis for the degree of master of science in medicine at the University of Minnesota to a clinical and pathological study of anæmia based on 69 cases in which splenectomy was performed at the Mayo Clinic from Nov. 14th, 1905, to Sept. 1st, 1920. Allusion to this series was made by Dr. W. J. Mayo at the recent congress of the International Society of Surgery. The average age of the patients was 33 years, the youngest being 2½ and the oldest 69. The distribution was about equal in both sexes, 36 being males and 33 females. There was apparently no familial tendency to the disease. The most frequent symptoms were enlargement of the spleen and a mass in the left side of the abdomen (29 cases), gastric hæmorrhage (20 cases), and weakness (19 cases). Abdominal pain was rarely mentioned as the chief complaint, but 32 patients gave a history of such attacks at some stage of the disease. In many instances the pain was probably due to perisplenitis, but in some cases it was due to other causes, such as gall-stones or chronic appendicitis. With a single exception in which it could not be felt owing to the presence of ascites, the spleen was palpable in every case, its average weight being 1015 g. Its relative position in the abdomen was preserved in spite of its progressive enlargement. On operation 26 patients were found to have enlarged livers and 30 definite cirrhosis of the liver, in only 13 of which the liver was larger than normal. The size of the liver did not seem to bear any relation to the size and weight of the spleen. Ascites was present in 24 cases, 23 of which had cirrhosis of the liver. In the remaining case the liver was enlarged but apparently not cirrhotic. The average red-cell count in the 69 cases was 3,700,000, the hæmoglobin 53 per cent., and the leucocytes 4900. The coagulation time and the fragility test were normal and the Wassermann reaction, which was performed in 60 cases, was negative. A composite chart of the leucocyte count showed that there was an initial rise of the leucocytes immediately after the operation, and that the number gradually increased up to 75 to 100 days after the operation. Lymphocytosis was not characteristic of this series. The highest mortality occurred within 40 days of the operation, during which period there were 12 deaths, 7 of which were in cases with marked hepatic cirrhosis. The principal pathological findings were as follows: On naked-eye examination fibrosis was very evident and the trabeculæ especially prominent. The degree of fibrosis of the reticulum seemed to vary with the amount of arterio-sclerosis, but there was no evidence to show that the fibrosis originated in or around the vessel walls. The amount of lymphoid tissue was usually below normal. The number and size of the Malpighian corpuscles were found to decrease as the size and weight of the spleen increased.

NON-TRAUMATIC DIAPHRAGMATIC HERNIA.

IN a paper read before the annual meeting of the Radiological Society of North America Dr. E. H. Kessler,[1] of St. Louis, remarks that while congenital diaphragmatic hernia is rare, hernia of the diaphragm caused by trauma, such as crushing injuries, gunshot wounds, and injury by the aspirating needle is not infrequent. In the course of two years he has met with four cases without any known history of injury. Two of the patients had been referred to him for gastro-intestinal examination on account of gastro-intestinal disturbance, the third for the confirmation of a diagnosis of pneumothorax, and the fourth had been sent to him for an examination of the heart. In two cases the hernia occurred through an abnormally large opening for the œsophagus, and two had an opening through the dome of the diaphragm. Dr. Kessler points out that we cannot be absolutely certain of the existence of non-traumatic hernia, as an injury may have been received without the patient's knowledge. The symptoms are not very distinctive and the history may be misleading. The condition, however, is easily recognised by the use of the X rays. As a rule, there is pain in the lower part of the left side of the chest which will have a resonant note if the stomach is full of gas, and there will be an absence of heart sounds in this area. Vomiting is not always present. There may be distension and dyspnœa, and, at times, regurgitation. Unless strangulation occurs the condition is not fatal. Dr. Kessler has collected 15 cases from recent literature of diaphragmatic hernia, six of which were congenital, eight traumatic, and one, like his own, without any history of injury.

THE TEACHING OF SURGERY BY KINEMATOGRAPHIC FILMS.

Doyen was the pioneer of the kinematographic teaching of surgical technique, and as far back as 1898 some of his operations were filmed for lecture purposes. Little was heard of surgical films in this country until a demonstration given three years ago by the Selig and Phillips Film Companies of the work of American surgeons, in which H. Lilienthal was seen performing a gastrostomy and F. H. Albee fixing an inlay bone-graft. An apparatus for taking the films has recently been perfected by Dr. Alex. v. Rothe, director of the Wilmersdorf Hospital in Berlin. The lens of this apparatus is contained in a spherical aseptic case suspended from the ceiling and focused by means of a periscope; it does not interfere in any way with the surgeon's freedom of action. The success has been such that the German Government has sanctioned the installation in six leading Berlin clinics. Some films obtained with the v. Rothe apparatus were shown by Dr. Bertram Stone last week at a private meeting of medical men in Portsmouth. They were noticeable for showing every detail of the operations from a vantage point which is denied to the ordinary onlooker, and, indeed, to the surgeon's assistant himself. The possibilities for teaching purposes opened up by this method are very great. Text-book descriptions convey little instruction when compared with kinematograph films, and the practising surgeon who nowadays is in the habit of travelling abroad at considerable expense to obtain inadequate glimpses of the technique of other operators than himself should in the future be able to study any particular operation as performed by the most eminent specialists in Europe and America without the necessity of going away from home. The surgeons whose work was displayed at Portsmouth were Krause, Bier, and Donitz, and the surgical procedures, which were shown in every detail from beginning to end, included a craniotomy for Jacksonian epilepsy with electrical localisation of the affected area of cortex, wiring a fractured patella, and gastro-enterostomy for a chronic gastric ulcer. The next desideratum is to obtain coloured films.

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[1] American Journal of the Medical Sciences, June, 1923.

[1] Journal of Radiology, June, 1923.

THE EXPERIMENTAL REPRODUCTION OF MALARIA.

THE problem of relapses in malaria is one of the most interesting from a practical point of view in addition to being one of the most complex. In the daily combat that individuals, associations, and nations engage in against the periodic epidemic, the resistant link in the chain that binds one yearly epidemic to another is represented by the malarial relapse; in treatment and prophylaxis the national measures which are tried are shattered against its exasperating insistence. The cure of the disease, therefore, and the prevention of the annual epidemics will proceed on rational lines as soon as the problem of the pathogenic mechanism of the relapse is solved. That the relapse is caused by the reproduction of the gametes in the circulation is no new idea, but the morphological demonstration of the fact has never met with universal acceptation and the problem in regard to the semilunar bodies is more than ever obscure owing to futile attempts to seek such evidence. There is an alternate method—viz., to attempt the reproduction of malaria by means of inoculating gametes only, and Prof. T. Pontano, of the University of Rome, has lately conducted some very interesting experiments on this point.[1] The experiments came under three categories, the first consisting of six inoculations of malarial blood quininised for a long period and containing crescent forms only, the second consisting of three experiments with malignant tertian blood which after quininisation was free from parasites, and the third of two experiments with malarial blood containing annular parasites and not quininised. Of these 11 experiments, the first six in which blood containing only crescent bodies was inoculated gave four positive results and two negative; the period of quininisation varied, being never less than seven days, from 16 to 74 days in the others, and had the object of destroying the asexual forms of the parasite. The amount of blood inoculated was from 8–10 c.cm., the incubation period varied from 7 11 days, and the identity of the malarial attack was proved by discovery of the parasite in the blood. fever, and enlargement of the spleen. The second series of experiments consisting of three inoculations of malarial blood which showed at first numerous asexual forms of plasmodium præcox and which after prolonged and intense quininisation became free from parasites, all gave negative results after clinical and hæmatological observation lasting from a month to a year. The donors were treated with daily doses of 2 g. of quinine and were sterilised much more easily. The last two experiments of injecting blood containing only annular forms of plasmodium præcox and not quininised both gave positive results. These experiments seem to show that the crescent body is responsible for the transmission of malaria and no longer represents in the circulation a sterile body but a gametic parasite, capable of generating schizonts, and further, that the asexual parasites or schizonts disappear from the circulation during and after intense quininisation. In these researches in which plasmodium præcox was inoculated the same parasite was always found in the relapses and transformation of one kind of malarial parasite into another was never seen. The chief point of interest in these observations is that intravenous inoculation of crescent-containing blood after prolonged quininisation and free from asexual parasites caused malarial infection in unaffected subjects, while, on the other hand, blood containing only schizonts but quininised until the disappearance of the parasites did not cause any infection; the crescents or gametes of plasmodium præcox were capable of proliferation and of generating asexual fever-producing parasites. Moreover, it was found that relapses occurred obstinately after inoculation with crescent-containing blood, while the experimental malaria caused by schizonts was easily curable. The schizonts which accompany the crescents in the circulation disappeared with difficulty after quininisation, while malarial blood was easily sterilised when schizonts alone were found in the peripheral circulation. These two facts find their explanation in the reproductive capacity of the gametes and in their resistances to the specific remedy.

SAILORS AND VENEREAL DISEASE.

THE Merchant's Shipping Act (Amendments) Bill, which received the Royal Assent and became law on August 2nd, removes a disability in the treatment of masters and sailors of the mercantile marine. Sub-section 1 of Section 34 of the Merchant's Shipping Act of 1906, whilst it provided for the gratuitous treatment of injuries and illnesses aboard ship and in hospital, categorically excluded venereal disease, with the result that sailors were not only denied treatment but were liable to be left friendless and without funds whilst in foreign hospitals. Foreign doctors and irregular practitioners charged excessive sums for treatment that was in many cases incomplete if not worse. The Royal Commission which sat between 1913 and 1915 advised gratuitous treatment in the British Isles for venereal disease, and last year 162,000 persons availed themselves of this privilege from which British sailors in British ships were excluded. The new Act is no more than a simple act of justice to the British seaman. Although the Bill consisted of a single clause it has entailed a good deal of hard work from Sir John Collie who was in charge of it, and who was fortunate in obtaining the hearty support of the Minister of Health and of Lord Wolmer, Parliamentary Secretary to the Board of Trade, as well as of the Shipping Federation and the Seafarer's Joint Council. From the public health point of view this small Bill is of considerable importance, for the perfunctory treatment which these cases received, and the concealment which the law encouraged, must have had a material effect in spreading disease when the sailors returned to this country. We congratulate the party whose efforts placed it on the Statute book.

THE USE OF THYMUS EXTRACT AS A THERAPEUTIC AGENT.

VERY little is known of the physiology and pathology of the thymus gland nor of the indications for its administration as a therapeutic agent. Felix Boenheim,[1] of Berlin, gives some results of treatment carried out by him with extracts of this organ in various pathological conditions. There is at present no clinical evidence of deficiency of the gland, and therefore it cannot be used as a substitute, as in the case of the thyroid, but experimentally it can be shown that the thymus counteracts some of the other endocrine glands, and so can be used when they are showing signs of excessive secretion. Combined with iodine, Dr. Boenheim finds that thymus has a very beneficial effect on colloid goitre and on exophthalmic goitre, the thymus preventing all traces of iodism. It has, however, no effect on the cysts in cases of cystic goitre, for while the general enlargement diminishes the cysts become more prominent. The treatment has been effective where

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[1] Il Policlinico, Medical Section, xxx., June 1st, 1923

[1] Deutsche medizinische Wochenschrift, April 13th, 1923.

X rays have proved valueless. In certain cases of hyperacidity of the gastric secretion associated with hyperthyroidism, administration of thymus restores the secretion to its normal content. Dr. Boenheim explains this phenomenon on the basis that one of the functions of the thymus is to diminish the rate of mobilisation of the chlorides, whereas the thyroid increases it. Increased function of the thyroid leads to increased mobilisation of chlorides. This causes hyperchlorhydria, which in its turn leads to hyperacidity and increased secretion of the gastric glands. The thymus counteracts this chain of events. In other forms of hyperacidity, such as that due to gastric ulcer, and the neural form (tabes), the thymus has no effect. In phthisis, thymus has proved a powerful aid, leading to an increase in the appetite and of the weight. This effect is probably due to its action on the gastric secretion in diminishing the hyperacidity which is often found in tuberculosis. Caution must be used during pregnancy, for here the thymus may have ill effects, and is not capable of antagonising the thyroid. The asthenias show great improvement with thymus administration. Dr. Boenheim recommends the preparation of Burroughs, Wellcome and Co., 1–2 tablets thrice daily, in preference to any of the German preparations.

THE CORPUS LUTEUM AFTER HYSTERECTOMY.

IT is usually assumed that extirpation of the uterus is without any very noticeable effect on the ovaries. Experiments in the guinea-pig by Leo Loeb, of Washington University,[1] show that a complete or almost complete extirpation of the uterus may be followed by a very characteristic effect—namely, a long-continued preservation and activity of the corpus luteum. Instead of beginning to degenerate 14 or 15 days after ovulation, the corpus luteum may remain well preserved and even show mitotic proliferation for 60 days or longer after the last heat. The cyclic corpus luteum thus equals or surpasses in vitality the corpus luteum of pregnancy, which latter has in the guinea-pig a duration of about 65 days. This effect—long preservation of the corpus luteum—occurs if the uterus is extirpated a few days after ovulation. If the uterus is extirpated in very young guinea-pigs when an ovulation has not yet occurred, the first ovulation takes place, notwithstanding the extirpation of the uterus, from 9 to 29 days after the operation. The corpus luteum which thus originates remains preserved for a long period of time with mitotic figures in the lutein cells. Extirpation of the uterus does not directly prevent ovulation, but it has such an effect indirectly by preserving the life of the corpora lutea. In other respects the ovaries in hysterectomised guinea-pigs are normal. Follicles grow in the normal manner, mature, and undergo atresia. These corpora lutea not only live, but they also function and prevent the occurrence of an ovulation during the whole period of their life; but if the corpora lutea are extirpated completely, a new ovulation takes place at an early period notwithstanding the absence of the uterus, an additional proof that the hysterectomy as such does not prevent ovulation. If, however, the maturation of follicles is prevented through underfeeding, a new corpus luteum does not develop in a young guinea-pig which has not yet ovulated, even after extirpation of the uterus. This marked prolongation in the life and function of the corpus luteum may not only be obtained after a complete hysterectomy, but even in cases where a very small amount of uterine tissue has been left unremoved. In hysterectomised animals the mammary gland develops quite markedly, and mitotic proliferation may be observed in such glands as late as 74 days after the last ovulation. If one-third or one-fourth of the length of the uterus is left unremoved the full effects of this operation are not observed, although the life and function of the corpus luteum is somewhat prolonged even under these conditions. It would seem, therefore, that a relatively small part of the uterus can at least to a great extent take over the function of the whole.

THE RÔLE OF PULEX IRRITANS IN THE SPREAD OF BUBONIC PLAGUE IN GREAT BRITAIN.

IN an instructive summary of our present knowledge upon the epidemiology of plague, Dr. William Lethem,[1] assistant medical officer of health for the City and Port of Liverpool, remarks that the disease, as it occurs in Britain now, differs notably from the pest of the Middle Ages. This decrease cannot be attributed solely to public health legislation, but in part at least to the almost complete disappearance of the old English black rat (*R. rattus*), which has been swept away by the brown or Norwegian rat (*R. decumanus*) since its introduction in 1727—one of the most remarkable instances in zoology of the replacement of one closely allied species by another. *Ceratophyllus fasciatus*, the plague flea of colder climates, is by no means such a successful carrier of plague as *Xenopsylla cheopis*, the plague flea of the tropics, nor does it bite man so readily; it lives by preference not on the rat itself, but in the nest, often situated underground. Under experimental conditions, this flea is known to carry infection for 47 days, considerably longer than *X. cheopis*, but owing to its habits man rarely comes into contact with *C. fasciatus*. In the tropics the black rat is a domestic species which lives in close contact with man, and harbours in its coat *X. cheopis*, a ready carrier of plague; the parasite, moreover, forsakes the rat immediately after its death. These differences may account for the scarcity of plague in Britain, but they do not explain why, when a case has occurred, the disease tends to be confined to a single household and to those in most intimate contact with the patient. Dr. Lethem thinks that the human flea (*Pulex irritans*) has hitherto been ruled out as a source of danger on very little evidence. It dies off at 85° F., and is less common in India than in Great Britain. When the outbreaks of plague since 1900 are considered, we find that, unlike tropical epidemics, either no plague rats are found or they are present in insufficient numbers to bear any relation to the human cases. It is suggested that in these instances *Pulex irritans* acts as a direct vector of the infection from one man to another. The most convincing instance of this is the Suffolk outbreak in 1910, in which seven bubonic cases occurred in one house in rapid succession. The human flea can only retain the infection for a few days, whilst the rat fleas can do so for 6 to 13 weeks. On the evidence it seems probable that epidemics of bubonic plague in Great Britain are not caused by the rat flea but that infection is spread by the human flea—*Pulex irritans*.

MINERS' NYSTAGMUS: THE QUESTION OF COMPENSATION.

THE second report of the Miners' Nystagmus Committee of the Medical Research Council, just published, discloses what appears to be a serious flaw in the Workmen's Compensation Act. The report is mainly the work of Mr. G. H. Pooley, but is endorsed by the other members of the committee—namely, Dr. J. S. Haldane, Prof. E L. Collis, and Dr. T. L Llewellyn. After contrasting the relative prevalence of *compensated* incapacity from this cause, on the one hand in France, Belgium and Germany, where it is small, with that in England, where it is great and increasing, it goes on to point out the explanation of this difference. This lies not in an increase in the number of those actually affected, but entirely, the report implies, in a very *decided increase* in the number of those seeking and obtaining compensation in this country, and this from three causes. In the first place the new schedule in 1913 altered the nomenclature of the disease from "nystagmus" to "the disease known as miners' nystagmus .... whether the symptom of oscillation of the eye-balls be present or not." The result was to include cases claiming compensation for psychoneurosis. Secondly, the maximum compensation money was raised in 1919 from 20s. to 35s. a week, and while wages and the cost of living have been reduced since then the compensation has remained the same. Consequently, it is found to be not rare for miners disabled from some general disease not arising from their work to be obtaining compensation for nystagmus which, if they had been otherwise in good health, they would not have claimed. In the third place, whereas abroad only severe cases of nystagmus are admitted for compensation, in this country slight cases are admitted under the belief that any degree of oscillation of the eye-balls renders the miner unsuitable for underground work and that it tends to get worse if underground work is continued. Owing to the combined action of these three causes, not only the number of fresh claims but the average duration of incapacity has risen enormously, facts which, the report implies, have no relation whatever to the actual prevalence of the disease, but solely to the facilities for obtaining compensation. In the opinion of the Committee the compensation is in many cases entirely unnecessary, as, in their opinion, mild cases of nystagmus do not necessarily involve incapacity for work, and in fact often persist for years without the knowledge of the patient. The most important conclusion is that "most cases of miners' nystagmus are only partially incapacitated; they benefit physically and psychologically by work. Some require work above ground; others are fit for suitable work below ground. All men in this group should receive every encouragement to start work as soon as possible."

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[1] Proc. Soc. for Expt. Biol. and Medicine, vol. xx., No. 8, 1923.

[1] The Medical Officer, July 21st, 1923.

It will be seen that this report throws down a challenge. If its conclusions are justified a drastic alteration in the law of compensation is called for, but the legislator may fairly demand some sort of unanimity of opinion among the experts. The important points at issue are first, whether the psychoneurotic symptoms are an essential part of the disease, and secondly, whether or not slight cases of nystagmus tend to become worse with a continuance of underground work. We do not propose to pass judgment as between the two opposing schools of thought, but merely to call attention to a matter which is not only of medical but of economic and sociological importance. It is alleged that thousands of pounds are being spent every week in a manner worse than wasteful. Can this challenge be answered?

SMALL-POX IN ENGLAND AND WALES.

THE epidemic of small-pox is definitely on the wane; 51 new cases were reported in England and Wales during the week ended July 28th, as compared with 116 new cases (with 1 death) in the preceding week, and 148 new cases (with 1 death) in the week before that. These 51 cases occurred in the following areas: Derbyshire 6 (Long Eaton); Gloucestershire 22 (all in Gloucester, and including 1 case previously notified as chicken-pox); Notts, 16 (Kirkby-in-Ashfield 9, Warsop 6, Basford R.D. 1); Yorks, North Riding, 1 (Middlesbrough); Yorks, West Riding, 4 (Bentley-with-Arksey 3, Doncaster 1); Monmouthshire 2 (Newport 1, Rhymney 1). There is diminishing incidence in all the areas affected and no new areas are involved. The outbreak is now following the course which is to be expected when the disease is frankly recognised and dealt with on the lines of established hygienic experience. The County of Devon, for instance, is bestirring itself, after years of fruitless discussion, to provide isolation accommodation throughout the administrative area, in which only two local authorities, Torquay and Plympton, have as yet made adequate provision. Vaccinations in Gloucester are stated to have averaged 2000 a month since April last.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXII.

TREATMENT OF EXOPHTHALMIC GOITRE AND OTHER FORMS OF HYPERTHYROIDISM.

IN undertaking the treatment of exophthalmic goitre and the allied conditions of simple hyperthyroidism and toxic adenoma, it is important to have a clear conception of the aims of the treatment and of the principles which underlie its practical application. In this group of maladies we have to deal with one common factor, the abnormal activity of the thyroid gland, in consequence of which an excess of secretion is poured into the blood and conveyed to the tissues of the body in which the thyroidal hormones raise the metabolic rate above the normal level. The problem we have to consider is how to restore the functional activity of the thyroid gland to a normal level as soon and as safely as possible. Whatever the true causation and pathology of exophthalmic goitre may be, experience shows that, provided no irreparable damage has been sustained by the heart, kidneys, or pancreas, when the function of the thyroid gland is restored to a normal level recovery takes place.

In estimating the results of treatment, the pulse-rate should be taken daily under the same circumstances when the patient is at rest, and the weight recorded each month. A steady diminution of the pulse-rate and increase in the weight are favourable indications. The tremor, nervousness, and mental excitability are additional guides as to progress. Regular monthly estimations of the basal metabolic rate, when circumstances allow of accurate observations being made, are of great value in assessing the value of treatment.

General Management.—The circumstances of each individual case should be fully investigated, so that all conditions which are likely to stimulate the thyroid gland may, as far as possible, be either removed or guarded against. Some of the most injurious factors which can often be controlled are those arising from nervous strain and anxiety, physical exertion, septic absorption, sexual excess, erroneous diet, and residence near the sea or in a hot climate. Other factors, such as accident, fright, shock, and worry, are beyond our power to prevent, though their ill-effects may be diminished by the exercise of additional care immediately after their occurrence. Thus, nervous strain arising from some special occupation may be relieved by change of work in mild cases, or by complete rest in severe ones. Change of surroundings, as from the town to a quiet country place, is often of service. The seaside should be avoided, as the symptoms are apt to be aggravated by a visit to the sea. Any occupation which involves such efforts as accelerate the already frequent pulse must be given up. In severe cases complete rest in bed for several weeks or even months is advisable. In mild cases, rest in bed for 12 hours at night and for two hours in the afternoon may be sufficient. Rest in the open air in a quiet garden is suitable for those who can stay in the country, and in warm weather as little exercise as possible should be taken. Any septic focus in the mouth, naso-pharynx, or elsewhere must be dealt with at the commencement of treatment.

Diet.—Red meats and their extracts should be avoided. Fish, eggs, chicken, and fat bacon can be allowed. Bread, vegetables, and fruit are suitable, and butter may be taken sparingly. If there is emaciation, milk may be given up to as much as three or four pints in the day. Half an ounce of cod-liver oil should be given daily in one or two doses. Alcohol and coffee should not be taken.

Medicinal Treatment.—A few drugs are useful in the treatment of the malady, and others are helpful in the relief of special symptoms and complications. Quinine hydrobromide, gr. iii.-v., thrice daily is of much value, though some patients are intolerant of it. Liquor arsenicalis, ℳ. iii.-v., may be given twice or thrice daily for three weeks each month for several months. If nervousness or tremor are marked symptoms, it is advisable to add sodium bromide, gr. v., to the mixture. The various organic preparations which have been employed, such as rodagen, half a drachm, or thyroidectin, gr. v., thrice daily, and the like, have yielded no consistently good results. The whole of the milk of a thyroidless goat has an excellent effect in some cases when an adequate supply has been obtainable. Suprarenal tablets have proved helpful in some cases. No preparation which contains any thyroid extract or iodine should be given.

Radiological and Electrical Treatment.—A prolonged course of treatment by X rays or radium in skilled hands is one of the most reliable means we possess of controlling the activity of the thyroid gland, and in many cases, of hastening its return to a normal condition. When X ray treatment is available, a dose of one and a half Sabouraud units, measured before filtration and passed through a layer of 3 mm. of aluminium and boiler felt placed on the skin, may be given twice a week. Later on this dose may be given at lengthening intervals, according to the progress made. Larger doses may be given at longer intervals, the object being to give as large a dose as possible without injury to the skin. This treatment finds its most favourable opportunity in cases of simple hyperthyroidism and in the milder cases of Graves's disease. It is also of value in severe cases. In cases of Graves's disease in which the goitre is unusually large, and in cases of toxic adenoma, the results are unsatisfactory, and if a subsequent operation becomes necessary, the capsular adhesions render it more difficult. For patients who live at a distance radium is more convenient, as the plates have only to be applied for 24 hours once every six weeks. A radiotherapeutic course requires six months, a year, or even two years to produce its full effect. Radium is unsuitable for acute cases of exophthalmic goitre, as the initial increase of secretion may prove fatal. When radiotherapeutical treatment is not available a mild interrupted current may be applied by means of electrodes placed over the goitre and at the back of the neck for an hour twice a day.

Complications.—Serious complications may develop in cases of Graves's disease. Thus dangerous crises may be set up by periods of acute hyperthyroidism during which the rapid increase of thyroxin and possibly of other hormones in the blood may cause a marked exacerbation of all the symptoms. In other cases only certain organs react violently to the stimulation. Thus there may be gastro-intestinal crises with intractable vomiting or diarrhœa. Cardio-vascular crises may occur with excessive palpitation, greatly increased pulse-rate, and marked restlessness. In all these absolute rest and quiet are essential. Cold may be applied alternately over the goitre and to the præcordium, if the pulse-rate is high, by means of a Leiter's tube or an ice-bag. In gastro-intestinal crises enemata of 5 to 10 oz. of warm water containing a drachm each of sodium bicarbonate and glucose may be given every four hours or run slowly and continuously into the rectum by syphonage from a thermos flask. Half an ounce of pancreatised milk may be given by the mouth every half hour. The vomiting may be controlled by small doses of morphia, given hypodermically or in a suppository, or by the injection of 0·5 c.cm. of pituitrin every 6 or 12 hours. Failing these, 5 gr. of chloral hydrate in a cachet may be given several times in the day. When diarrhœa is a prominent symptom, laudanum may be given with dilute sulphuric acid as required. In the later stages of severe cases of exophthalmic goitre chronic myocarditis with dilatation and hypertrophy of the heart may be present. Under these circumstances there may be auricular fibrillation and gradual cardiac failure. The treatment of this complication is the same as in cardiac failure from other causes, and digitalis or quinidine sulphate may appropriately be employed.

Surgical Treatment.—Although discussion of the surgical treatment does not come within the scope of this article, a brief statement as to the chief indications for operation may be given. In cases of simple hyperthyroidism and in mild cases of Graves's disease no operation is required. In cases of toxic adenoma of the thyroid gland, and in all cases in which signs of pressure on the trachea or recurrent laryngeal nerves are present, operation is required, as cases of toxic adenoma do not as a rule do well under medical treatment, and pressure signs require immediate relief. The selection of suitable cases of Graves's disease for operation is difficult. Cases in which no improvement has taken place after six months' trial of medical treatment, and those in which the goitre is unusually large, are the most suitable for operative treatment by ligation of the thyroid vessels or by partial removal of the goitre. In other cases the physical condition, social position, and wishes of the patient must all be fully considered in the selection of each individual case for operation, for with every care the mortality after operation, though gradually diminishing, is still from 3 to 5 per cent.

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Special Articles.

BRITISH DENTAL ASSOCIATION:
ANNUAL MEETING AT MANCHESTER.

ABOUT 400 dentists are attending the forty-third annual meeting which opened at Manchester in the College of Technology on July 31st, the President being Mr. George G. Campion, of Manchester. It is 31 years since the Association met in this city and the President for the current year is the son of Mr. H. Campion, of Manchester, who was President when the Association last visited the city. The Senior Pro-Vice-Chancellor of the University—Mr. Edward Fiddes—described the growth of the dental school established at the University 39 years ago, and now attended by over 140 students, university training having superseded the former practice of apprenticeship.

President's Address.

The President, in his inaugural address, emphasised the change that had come over dentistry in the last two decades, and congratulated the Association on the fact that their views as to the relation of the State and the dentist had at last received recognition by the Government, and that the Government had at last laid down a skeleton organisation for dealing with this urgent problem of national health and efficiency. It was now known, on the authority of a Government Committee's report, that one-third of all disease in the country was due directly or indirectly to dental disease. Among the general population it was found that the condition of the teeth of women was worse than that of men. In the Western Command from April, 1917, to March, 1918, it was found that between 80 and 90 per cent. of recruits were in need of dental treatment. To avoid the trouble which follows dental disease it was essential to provide from earliest childhood for adequate inspection and treatment, including the practice of cleanliness, the use of a detergent diet, and early conservative dentistry. The State and local authorities had created a nucleus of an organisation for the application of dental knowledge by arranging a dental service in 232 of the 1870 maternity and child welfare clinics now functioning in England and Wales. Other forms of dental service were those of school clinics, tuberculosis clinics, additional benefit under the Health Insurance Act, industrial dental clinics, and the Royal Naval Dental Service and Army Dental Corps. At present—even with the clinics privately organised by a large number of industrial firms—the national service was quite inadequate. School clinics were at present staffed by about 450 dental officers—compared with the school population for England and Wales of about 7 million. For efficient dental work it was calculated that there should be one dental officer for each 5000 children. At present there was not the equivalent of one officer for each 15,000 children. As showing what can be done by the cumulative benefit of treatment over a number of years at a school dental clinic, Cambridge affords a classical example. In 1908, at this clinic only 15 per cent. of the children had sound permanent teeth; the figures in 1920 had been reversed, and the percentage had become 51. Views stated by members of the dental profession ten or more years ago were now proclaimed by the Ministry of Health. Above all the enlightenment of the public on the need for early conservative dentistry must not be relaxed by the Association. The next meeting of the Association will be held in Edinburgh next year, and Mr. J. S. Amoore (Edinburgh) was elected as the succeeding president.

Effects of Diet on the Structure of the Teeth.

At the meeting on August 1st Mrs. May Mellanby spoke on the effects of diet on the structure of the teeth, expounding the researches she had made on behalf of the Medical Research Council on the question of growth of the teeth in dogs. It was proved that the amount of calcium in the diet was not the dominant factor in the calcification of teeth; in this connexion particular importance had to be attached to the content of vitamin A in the diet, which, taken in large amounts, retained and incorporated in the tissues of the body, more especially in the teeth, the calcium salts in the diet. If this vitamin was deficient in the diet, the more cereal was eaten the worse formed were the teeth. Both dentine and enamel were very defective on a diet of oatmeal, but when cod-liver oil rich in vitamin A was added to the oatmeal diet, the dentine and enamel were practically normal. Mrs. Mellanby wished to make it clear that the calcium and phosphorus of the diet do not in themselves control teeth calcification but that their action is subservient to other elements of the diet. The effects of oatmeal on the formation of the teeth raised the question of the excellent teeth of the Highlander at a time when oatmeal formed a large part of his diet. No doubt the calcifying vitamin of herring would play an important part. Milk would also antagonise the action of oatmeal. Thus a diet of milk, eggs, green vegetables, herring, and oatmeal would be expected on the basis of the experimental results to produce perfectly normal teeth. On the other hand, dietary made up of cereals, and especially oatmeal, together with such food as vegetable margarine, lard, lean meat, jam, sugar, tea, all substances of widespread consumption in modern dietaries, would be expected to lead to the development of defective teeth and jaws.

Æsthetic Considerations.

Mr. Edward C. Kirk, in a communication on Artistic Harmony in Dentures, expressed regret that despite the best endeavours of dentists to persuade their clients to accept artificial teeth which were in harmony with the wearer's other features and expressive of individual character, the public appeared still to demand the ghastly exhibits of unquestionably false teeth of geometrical evenness and glittering whiteness, worn indiscriminately by certain sections of the community, young and old, of both sexes. The speaker suggested a connexion between this untoward phenomenon and the superstition, prevalent in some parts of central Europe, that if as the milk teeth were shed the child dropped them into a mouse-hole, the succeeding teeth would be small, white, and even like the teeth of a mouse.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(Continued from p. 253.)

SECTION OF SURGERY.

WEDNESDAY, JULY 25TH.

ON the first day of this section Sir HENRY GRAY, the President, being in the chair, a discussion on the

Treatment of Obstruction of the Colon

was opened by Prof. A. H. BURGESS (Manchester), who based his remarks on the statistics of the Manchester Royal Infirmary during the ten year period 1913–22. During this time out of a total admission of 66,373 cases to the wards, 1278 were for obstruction of the small or large intestine—the term "obstruction" being taken for the purpose of the discussion to include only those cases in which some gross mechanical obstacle was present. Excluding cases of intussusception, the colon was concerned in 199 of the 1278 cases, or 17·87 per cent., the pathological causes of the acute obstruction being distributed as in Table I.

TABLE I.

—	No. of cases.	Deaths.	Percentage mortality.
Malignant growths of colon ..	173	59	34·1
Extracolonic malignant growths	2	0	
Strangulated hernia	9	3	33·3
Adhesions	7	0	
Tuberculous disease of cæcum ..	2	0	
Acute diverticulitis	1	0	
Volvulus	5	2	40·0
Total	199	64	32·2

The table showed the great preponderance of malignant growth as compared with other causes of acute colonic obstruction, constituting nearly 90 per cent. of all cases. During the period under review 485 cases of malignant growth of the large intestine were admitted, 173 of which were associated with acute obstruction, giving a percentage of 35·67. A table was given showing the proportional distribution of these growths with the relative incidence of acute obstruction at each site and the mortality. The figures showed that the rectum was concerned in 46·59 of all growths, but only for 10·98 of those associated with acute obstruction. The sigmoid colon showed a percentage frequency of 29·48 but occurred in 51·44 per cent. of all cases of acute colonic obstruction from malignant growth. The cæcum showed a percentage frequency of 5·15, and a percentage association of obstruction of 6·35. It was also shown that only 13·29 per cent. of the growths causing obstruction were on the right side, as against 86·7 per cent. on the left—a fact not without importance in relation to operative treatment.

The various operations performed for malignant and non-malignant obstruction were included in Table II.

He laid it down as a basic principle of the treatment of acute obstruction of the colon that—contrary to the principle obtaining in the case of the small intestine where it is the operation of choice—resection with immediate restoration of continuity (that is, without drainage of the proximal bowel) is an unjustifiable procedure. In the series under review it was performed 9 times with 3 recoveries (2 of cæcum, 1 of sigmoid) and 6 deaths (1 of transverse colon, 1 of splenic flexure, and 4 of sigmoid)—a mortality of 66·6 per cent., which was almost double the average mortality of the whole series. In the ileo-cæcal region the conditions approximated to those obtaining in the small bowel, and this was the only region of the colon in which primary resection followed by immediate anastomosis might be done. Whenever resection of the colon was essential, as in gangrene from volvulus and internal strangulation, it should be combined with drainage of each end of the bowel, preferably by tying in a Paul's tube; at a later operation continuity might be restored. This two-stage operation was sometimes advocated in acute colonic obstruction from malignant growth, but should, in the speaker's opinion, be restricted to cases in which the colon was grangrenous. In malignant growth it was better to do a cæcostomy for the immediate relief of the obstruction and to follow this up later by a thorough excision of the affected portion of the bowel and its corresponding lymphatic area.

TABLE II.

—	No. of cases.	Deaths.	Percentage mortality.
A. *Malignant Obstructions*—175 cases (173 growths of colon, 2 extracolonic growths).			
1. Exploratory laparotomy, followed by—			
(*a*) Primary resection ..	9	6	66·6
(*b*) Lateral anastomosis ..	11	3	27·7
(*c*) Cæcostomy	56	18	32·1
(*d*) Colostomy, transverse ..	13	5	38·5
(*e*) Colostomy, sigmoid ..	63	21	33·3
2. Colostomy alone (all sigmoid)	17	5	29·4
3. Cæcostomy alone	5	3	60·0
4. Enterostomy alone.. ..	1	1	100·0
Total	175	62	35·2
B. *Non-Malignant Obstructions.*			
1. Herniotomy..	9	3	33·33
2. Division of adhesions ..	7	0	
3. Ileo-sigmoidostomy for tuberculous cæcum	2	0	
4. Laparotomy and drainage for acute diverticulitis	1	0	
5. Volvulus—			
(*a*) Untwisting alone ..	1	1	100·0
(*b*) Untwisting combined with colostomy	4	1	25·0
Total	24	5	20·8
Total of all cases ..	199	67	33·7

Lateral anastomosis was performed in 11 cases with 3 deaths. In all these cases a preliminary laparotomy had disclosed an inoperable malignant growth and the palliative anastomosis was the alternative to colostomy. In obstruction from growth of the colon a cæco-colostomy should be performed rather than an ileo-colostomy in cases where the ileo-cæcal valve is competent to prevent the regurgitation of cæcal contents into the ileum, an ileo-colostomy entailing in such circumstances, unless combined with either appendicostomy or cæcostomy to prevent tension, a serious risk of gangrene or perforation of the cæcum.

Prof. Burgess then discussed the treatment of acute obstruction of the colon: (1) When it was uncertain whether the obstruction was in the ileum or in the colon; (2) when the obstruction was known to be in the colon but its exact situation was unknown; and (3) when the site of the obstruction in the colon was definitely known.

1. A careful inquiry into the history was useful, the absence of any intestinal troubles prior to the onset of obstruction being in favour of the implication of the small intestine, while pain, diarrhœa, constipation, mucus, with or without blood, in the stools suggested colonic obstruction. The use of the sigmoidoscope and of radiography was scarcely practicable in acute cases, and reliance had to be placed chiefly upon a physical examination of the distended abdomen; its shape, the position of the bulging, the presence of "ladder patterns," as in ileal obstruction, the detection of visible or of palpable peristalsis. Auscultation was also useful to an experienced observer. The "keynote" to the diagnosis was the condition of the cæcum; if this was visibly distended or was felt alternately to harden and soften under the fingers the obstruction was distal to it. When all methods of physical investigation failed, including rectal and vaginal examination, an exploratory laparotomy must be made, preferably through a paramedian incision, splitting the fibres of the lower portion of the right rectus abdominis. When the obstruction was located and its cause found to be an operable growth, the incision could usually be closed and a cæcostomy performed through a "gridiron" incision in the right iliac fossa. Where the growth was inoperable, short-circuiting was indicated where practicable, or failing this a colostomy just above the growth. In the most desperate cases of group (*a*) it was better to make no attempt to find the obstruction, but the cæcum should be exposed under local anæsthesia, and if found distended should immediately be opened ("blind" cæcostomy); if collapsed the first distended coil of ileum presenting should be opened and drained ("blind" enterostomy). In the latter case, should the patient survive further surgical intervention would certainly be called for later on.

2. In cases belonging to this group there was, as the statistics showed, an overwhelming chance that the obstruction was a malignant growth and situated on the left side. In severe cases a "blind" cæcostomy under local anæsthesia was indicated. In mild cases, in the absence of any localised tenderness over the cæcum, conservative measures such as repeated enemata, &c., might remove the obstruction, allowing a radical exploration to be made at a later date. In the moderately severe cases the choice of preliminary procedure lay between a paramedian exploration and a "blind" cæcostomy. The advantages of the latter were: (1) It could be performed rapidly under local anæsthesia, and with the minimum of shock. (2) There was no interference with the growth and no new adhesions were formed. (3) The cæcostomy opening was as far removed from the area of any further operation as an artificial anus could be. (4) It formed a good safety valve during any subsequent resection operation, giving rest to the sutured bowel and minimising the risk of leakage at the point of suture. (5) When not further required it often closed spontaneously on leaving out the tube, or in any case could readily be sutured. On the other hand, an adequate exploratory operation was always difficult in a distended abdomen, required a general or spinal anæsthetic, and gave information (as to the site and nature of the obstruction) which, however valuable, was not essential at that stage of the proceedings. The speaker was firmly convinced that when in any given case of acute intestinal obstruction the site of obstruction could be located to the colon but was not more precisely known, and where there was no special reason to suspect volvulus or internal strangulation, "blind" cæcostomy should be performed as the sole immediate procedure.

3. In this group in which the actual situation of the colonic obstruction was known, where rectal examination showed the growth to be inoperable on account of local fixation to bladder, prostate, uterus, or sacrum, the operation of choice was a sigmoidostomy, since with a growth so low a future palliative short-circuit was impracticable. Where the growth was determined by rectal palpation to be operable, he preferred a laparotomy through a left paramedian incision, concluding the operation by fixing a loop of the sigmoid into the wound and opening either at once or a few hours later. In cases of palpable abdominal tumour or where obstruction had supervened shortly after a sigmoidoscopic or radioscopic investigation had disclosed its probable site, a cæcostomy was indicated for the immediate relief of obstruction, leaving the field clear for a later exploratory laparotomy, when resection, short-circuit, exclusion, sigmoidostomy, or transverse colostomy might be feasible, in this order of preference. Where none of these was practicable, the incision would be closed and the cæcostomy left as the permanent condition.

In conclusion, Prof. Burgess pointed out that although he had laid stress throughout his paper on what he believed to be the correct principles in the treatment of colonic obstruction once it had developed, yet it was to the earlier recognition of its most frequent cause—malignant growth—prior to the onset of that very serious complication that the attention of surgeons should in the future increasingly be directed.

Mr. SEYMOUR BARLING (Birmingham) said that there were three points he would wish to make. First with regard to diagnosis, he thought that no one would deny that it was of great advantage to the surgeon if the site of the obstruction were accurately known, and he emphasised the difficulty that this presented in so many cases. He therefore put before the meeting a new method of diagnosis, which he had recently used in three cases of acute intestinal obstruction. Provided that the patient was in a sufficiently fit condition to be able to stand upright for five seconds there was no contra-indication to the method. The patient was taken to the X ray room and screened in the upright position. In his case the intestine above the obstruction showed out very distinctly, and in one case in which the sigmoid was the seat of an annular carcinoma a horseshoe area of gas was seen with pools of fluid at each end, one in the cæcum and one just above the growth. He suggested that this procedure was of great value, and enabled one to relieve the obstruction with one's eyes open, and without any need for exploring the abdomen. Secondly, he wished to remind the section once again of the very poor operative risks most cases of acute intestinal obstruction were. He was sure that they had all had those distressing cases of collapse after quite small procedures. Therefore he urged that a cæcostomy done under a local anæsthesia was the operation of choice, and gave the lowest immediate mortality. Lastly, though an advocate of the cæcostomy, yet he realised some of its disadvantages, amongst them being the undoubted fact that it did not empty the distal part of the colon, and did not obtain that collapsed and empty colon that surgeons wished to see at the line of resection. He thought that the advocates of a blind cæcostomy must face the possibility of a second drainage operation prior to the main attack on the growth.

Mr. Arthur Mitchell (Belfast) felt that he must take exception to Mr. Seymour Barling's remark that quite small procedures produce sudden and severe collapse. He thought that any exploration in cases of acute intestinal obstruction was very dangerous. It required extreme gentleness and absence of exposure, for the distended gut was very easily contused by the hand in the peritoneal cavity, and such contusions only added to the causes giving rise to toxic absorption. He was quite in accord that the easiest, safest, and more rapid method of relieving the obstruction was the correct thing to do, and he agreed that a blind cæcostomy fulfilled these conditions. At the same time he agreed that a cæcostomy did not always completely drain the obstructed colon, but it did abolish absorption of toxic contents. He was interested in Prof. Burgess's figures concerning lateral anastomosis, and was of opinion that this procedure might be more often used with advantage in inoperable cases. He considered that when a permanent colostomy was to be performed the most important consideration was the comfort of the patient, and in this connexion he strongly advised that the distal end should be completely divided, closed, and dropped back into the peritoneal cavity, and the proximal end sutured to the wound. He entered a plea for earlier diagnosis, and emphasised the great importance of diarrhœa as an early symptom. In conclusion, he quoted a case of a man aged 72 with acute obstruction of the sigmoid, in which the cause was a syphilitic infiltration and which was cured by antisyphilitic treatment.

Mr. Herbert Carson (London) said that he had had 79 cases of this kind in the large intestine, of these two were due to diverticulitis, five to ileo-cæcal tuberculosis, and 72 to carcinoma. Of these 45 per cent. had had acute intestinal obstruction, the site of which was mainly on the left side. Up to three years ago, only 35 per cent. were operable, but in the last three years the proportion had risen to 52 per cent. He wished to state emphatically that these cases should never be allowed to become obstructed, and that a great need existed for educating students and the general public in the premonitory symptoms. He recognised three clinical types of obstruction of the colon: 1. Partial obstruction, in which symptoms called early attention to the diagnosis, and in which a carefully planned radical attack on the growth was possible. 2. Chronic obstruction which had become acute, in which it was permissible to temporise, and treat with enemata and aperients, keeping a strict guard on the condition of the cæcum. These cases might thus be converted into group 1 cases. If necessary, the cæcum acting as the guide, a drainage operation might become necessary. 3. Acute obstruction the first sign. In these no single stage operation was ever possible, except with growths at the ileo-cæcal valve. He confessed that he was not yet convinced of the advantage of blind cæcostomy, and in his opinion there were the following disadvantages: cases of intussusception with the lump in the left side were unsuitable, a volvulus was not affected at all by a cæcostomy, cases of double obstruction in which the small intestine was involved secondarily to the large were not relieved, and lastly, in inoperable cases a cæcostomy might be a most unsuitable permanent condition, and yet some cases would not stand another operation. But he was a firm believer in a cæcostomy as a step in the technique of every resection. He also pleaded for the avoidance of long blind ends.

Mr. P. Lockhart-Mummery (London) congratulated Prof. Burgess on his excellent paper. He pointed out that the mortality from operations for acute intestinal obstruction was 32 per cent., and that this, though comparing favourably with the figures from hospitals dealing with large industrial areas, was far too high, for we could not face a one in three death-rate with equanimity. He considered that this mortality could be greatly improved by performing blind cæcostomy and postponing the exploration till a later time. The other important factor was the use of local or regional anæsthesia, for he believed that inhalation anæsthesia should never be used in these cases. Mr. Lockhart-Mummery said that not only did he not do a blind cæcostomy on every case of acute colonic obstruction, but he made a practice of performing it as part of any operation which involved division of the colon. He had found that the mortality of colectomy had fallen considerably since the adoption of this procedure. The method of performing cæcostomy was the one he had described in The Lancet, 1922, ii., 1117. He again stressed the importance of performing this operation under local anæsthesia.

Prof. C. A. Pannett (London) said that he thought it was by no means easy to be certain that the obstruction in any given case was of the small or the large intestine, for these patients were usually toxic, often in great pain, and frequently unable to give a lucid history. He was personally against a blind cæcostomy unless he was sure of the large bowel being the seat of the obstruction. He quoted 47 cases of acute intestinal obstruction of the colon at St. Mary's Hospital; all had been explored at the time of the drainage operation. Of these one had died, and he felt that the dangers resulting from a further exploration were greatly over-estimated. Of these 47 cases only one-third were operable, and of the remaining two-thirds just over one-half could not be short-circuited. It seemed reasonable to him to ask the advocates of a blind cæcostomy why these people should have two colic fistulæ instead of one. When a blind cæcostomy had been done, he felt that every effort should be made to localise the growth prior to the main attack on it, and in this connexion he mentioned the fact that barium enemata were occasionally very misleading, and he showed four lantern slides illustrating X ray plates in which the barium had got past the stricture and filled the gut above.

Mr. Geary Grant (Cardiff) said that in his opinion a cæcostomy with a tightly distended œdematous and friable cæcum was not so easy as some would have us believe, and he was in favour of a colostomy.

Mr. C. P. Childe (Portsmouth) thought that in this question it was most desirable to exercise sound judgment and not to be bound by any hard-and-fast rules. He felt that it was self-evident that very severely toxic cases could only be dealt with satisfactorily by a blind cæcostomy, but he was convinced that early cases could be explored without any immediate ill-results following.

Mr. R. D. MOTHERSOLE (Bolton), speaking from the point of view of the general practitioner, said that he thought a colostomy had much to recommend it over a cæcostomy.

Mr. M. MAMOURIAN (Ashton-under-Lyne) said that the procedure was governed by the patient's condition. When he found a cæcostomy necessary he used a Murphy's button.

Prof. BURGESS, in concluding the discussion, said that he was convinced that blind cæcostomy was the right thing to do. He quite agreed that perhaps one or two cases of volvuli or gangrenous intestine in 100 might be missed, but what was that if the mortality were reduced from over 30 per cent. to under 10 per cent.

A short paper on the question

Are the Results of the Operative Treatment of Malignant Disease Better than Twenty Years Ago?

was read by Mr. HERBERT J. PATERSON (London), who pointed out that although there was no doubt that during the past quarter of a century surgical technique had greatly improved, and that many of the risks of operation had been materially lessened in spite of the fact that operations practised for malignant disease had become more extensive and radical, there was no convincing evidence that the proportion of ultimate successes was greater than was the case 20 years ago. The returns of the Registrar-General showed an increase in deaths from cancer, amounting to nearly 30 per cent. in the year 1921 as compared with the year 1900, and it was difficult to ascribe this increase entirely to the heightened incidence of cancer and to more accurate death certification. A review of post-operative statistics showed that the percentage of cases free from recurrence after 3 to 5 years was much the same now as it was 25 years ago, and this was true even where mammary cancer was concerned, in operations for which 20 years ago the axilla was not cleared out as a routine measure but only where there was evidence that the glands were involved. In connexion with this apparent lack of progress he would suggest the possibility that the teaching of pathology had been allowed to override clinical experience—e.g., cancer cells had been shown microscopically to be scattered far beyond the macroscopic limits of a growth, and therefore a wide and extensive excision was advocated—whereas clinical experience had shown that operations in which the margin of the growth was very close to the line of resection were sometimes followed by a long interval of immunity, a fact which suggested that the tissues could and often did destroy the isolated cells which were left behind beyond the line of excision. The efforts of modern surgeons had been directed towards more extensive operations, whereas earlier diagnosis and earlier operation should have been their aim.

Mr. Paterson also suggested that in modern surgery the lymphatic glands were attacked too ruthlessly, and that the part played by these glands in the defensive mechanism of the body was scarcely sufficiently appreciated. He recalled Crile's statement that remote visceral metastases were found in less than 1 per cent. of the cases of cancer of the head, face, and neck, and that the disease was almost invariably limited to the extensive collar of lymphatics surrounding the neck; but whereas Crile looked upon this fact as a clear indication of the necessity for the removal en bloc of these glands, the speaker believed this inference to be illogical, and urged that the barrier of glands should be left for several weeks after the removal of the primary growth. He had operated upon eight cases of carcinoma of the tongue by this method, one of whom died of broncho-pneumonia seven days after the operation, one died 15 months after the operation, one was untraced, and was assumed to be dead, while the remaining five were alive and well, four of them more than six years after the original operation. For the past three years he had adopted a similar method in dealing with cancer of the breast, but it was too early to judge of results. He submitted that there was solid justification for an extended trial of this procedure of operation in two stages whenever practicable—i.e., removal of the growth, followed at a later period by removal of the glands. He concluded by emphasising the necessity for a vigorous campaign to impress on the public the supreme importance of early recognition of the disease, and of early operation, which, so far as their present knowledge went, offered the only hope of cure.

THURSDAY, JULY 26TH.

On the second day, Sir HENRY GRAY (Aberdeen) again being in the chair, Mr. D. P. D. WILKIE (Edinburgh) opened a discussion on the

Treatment of Acute Primary Infections of the Hand,

including sequelæ. Mr. Wilkie began by pointing out the great importance of the subject both from a medical and from an economic standpoint, touching as it did the wide problems of infection, resistance, and immunity. He deprecated the tendency in hospital practice to look upon infections of the hand as belonging to the realm of minor surgery to be dealt with by the less experienced members of the staff, whereas not only did no class of case present more difficult problems, but also upon the line of treatment adopted the very life of the patient might depend. In discussing the subject there were certain fundamental pathological considerations that had to be borne in mind. The introduction of pathogenic micro-organisms into the tissues was followed by well-defined general and local tissue changes; but although these reactions were essentially protective in function, in the hand the outpouring of lymph and the local aggregation of phagocytes might, in areas in which space was limited, cause a high degree of tension, endangering the vascular supply and the vitality of the part. In addition to this, the concentrated toxins of the infecting bacteria, together with the proteolytic ferment liberated from the dead and dying phagocytes, tended to produce the death and liquefaction of the neighbouring tissue cells, and from such an area there would inevitably be a deleterious absorption of bacterial toxins and proteoses. The aim of surgical intervention was to provide for the drainage of such areas of suppuration and tension before the occurrence of irreparable damage; and in this connexion it was well to bear in mind that the disability following even an unnecessarily extensive incision was negligible in comparison with that resulting from a burrowing, liquefying, and prolonged suppuration followed by the inevitable fibrosis, fixing tendons and muscles, stiffening joints and compressing nerves and blood-vessels. The preservation of tissue without function was a mere waste of time and energy.

Anatomical Considerations.—There were three points in the anatomy of the hand that had an important bearing on the spread of infection in this region. (*a*) The extensive network of lymphatic vessels in the hand, especially on its palmar aspect. (*b*) The division of the cellular tissue into spaces. In the pulp of the fingers dense fibrous septa, extending down to the periosteum of the phalanx, enclosed the fatty tissue, infection of this tissue leading to great tension, with necrosis which was very apt to involve the bone. In the palm of the hand the two most important of the deep cellular spaces were the middle palmar and the thenar spaces. A collection of pus in the middle palmar space tended to point along the lumbrical muscles of the third, fourth, and fifth fingers; and in the thenar space it tended to point at the radial side of the index finger. A knowledge of the existence and boundaries of these spaces was essential for the early recognition and drainage of a collection of pus in either situation. (*c*) The anatomical arrangements of the tendon sheaths, owing to which any accumulation in them under tension was apt to rupture either into one of the palmar spaces or into the deep cellular planes of the forearm underneath the flexor communis digitorum, with the frequent sequel of infection of the first interphalangeal joints.

Types of Infection.—These were two: lymphatic and suppurative. In the lymphatic type the infecting organism was almost invariably the streptococcus, and the danger of septicæmia was a very real one. It was vital that a correct diagnosis should be made, as the treatment of such cases differed fundamentally from that of suppurating whitlow. The suppurative type occurred either as a cellulitis, or as a tendon-sheath infection, the former occurring mainly either in the tip of the finger or deep in the palm of the hand, and the latter either as a primary infection of the sheath from a direct wound, or as a complication of a lymphatic infection of a finger. The essential features of tendon-sheath infection were the early development of tension owing to the limited capacity for expansion possessed by the sheath, and the precarious nutrition of the structures within the sheath. A complication which may follow either of these types of infection—cellular or tendon sheath—was infection of the phalanges and interphalangeal joints.

Diagnosis.—The first essential in diagnosis was to decide which type of infection was present. In acute lymphatic infection there was marked constitutional disturbance, slight local swelling, swelling of the axillary glands, and red lines up the arms. In the suppurative type there was either (*a*) a localised swelling at the tip of the finger with tense and tender pulp, or (*b*) a slight prominence of the palm and marked œdema of the dorsum of the hand, with or without a swelling in the cleft between the fingers, or (*c*) a uniform swelling of the finger, flexed position, pain on passive extension and tenderness on pressure over the proximal part of palmar aspect of the finger, or (*d*) a combination of these according to whether or not the tendon sheaths were infected.

Treatment.—Great emphasis was laid upon the importance of prophylaxis in the shape of prompt antiseptic dressing of all wounds, especially in centres of organised industry. Where infection was already present the following principles were to be borne in mind: 1. The necessity for working with and not against Nature in her efforts to localise and limit the spread of infection. 2. The necessity for incising at the earliest possible moment where pus had accumulated under tension. 3. The necessity for making large incisions allowing of free drainage where spreading suppuration was present. 4. The importance of rest to an inflamed part. 5. The necessity for exercising the minimum of interference with the functional capacity of the hand compatible with the arrest and localisation of the infection. During the early stages of acute lymphatic infection no incision was ever to be made. The principles of treatment in these cases were to diminish absorption, to aid local resistance, to combat toxæmia, and, where possible, to give passive immunity. Bier's passive hyperæmia was probably the most valuable therapeutic measure in the acute lymphatic type, other auxiliary remedies being the giving of fluid in large quantities by mouth or rectum, and the subcutaneous injection of large doses (50 c.cm.) of polyvalent antistreptococcic serum.

In suppurative cellulitis early incision with free drainage was always indicated. Two lateral incisions in the finger pulp would completely relieve tension, and, if made in time, would save the phalanx from necrosis. For deep suppuration in the palm it was necessary to make an incision in a cleft between two fingers and to thrust a sinus forceps in along a lumbrical canal. For suppuration in the thenar space, through-and-through drainage of the first interosseous space was essential. In the treatment of nail-fold infections where the pus had already made its way out under the fold, the essential for rapid healing was to pack in strands of gauze between the nail and the fold with the blunt end of a straight sewing needle. In infective teno-synovitis free incision at the earliest possible moment under a general anæsthetic was necessary. a tourniquet in the shape of an Esmarch's bandage to the upper arm being advisable. It was a good rule to make all incisions sufficiently free to obviate the use of drainage-tubes, and so to limit the subsequent fibrosis. The after-treatment included moist dressings and hot saline baths until the subsidence of the acute inflammation. In cellulitis rest should be the rule until there was definite localisation of the infection, after which movement was to be encouraged. In tendon-sheath infections movements, active and passive, were indicated at as early a stage as possible, delay in instituting appropriate exercises endangering the ultimate utility of the hand.

Mr. C. M. Page (London) emphasised the importance of the subject from an economic aspect, and insisted that all such patients should be treated as in-patients and not as out-patients. He criticised Wilkie's classification in that lymphatic infections may be more or less chronic, and he preferred to call the severe cases fulminating streptococcal infections. He agreed that in these cases incisions were quite wrong and did a great deal of harm. In other types of infection the main object was to relieve tension by affording an outlet to the pus, and he did not consider the opening up of spaces by forceps advisable, as by this procedure tissues were often infected. The after-dressings were important, and he preferred dry gauze or paraffin gauze to wet dressings. With regard to the restoration of function in these hands, he found that if tendons had sloughed away plastic surgery offered very little hope of success in obtaining functioning tendons, but if the tendons were intact much could be done. He deprecated the common custom of treating these hands on a straight splint, for if adhesions formed it became impossible to get flexion of the fingers. They should always be treated half-way between flexion and extension, and then later full flexion could be obtained, either by graduated extension splinting or by breaking down the adhesions under an anæsthetic. He had found the paraffin bath very useful in the after-treatment of these cases, but he could not explain the rationale of the treatment.

Mr. F. D. Saner (London) thought that not sufficient attention was paid to prophylaxis of hand and finger infections, and he felt that it might be advisable to recommend immediate excision of all wounds and pinpricks. Whenever the patient had the premonitory symptoms the infection had already gained a foothold, and in such cases without actual pus formation he preferred large hot fomentations; and not until grave constitutional symptoms had supervened did he advise incision. He then called attention to the dilemma often confronting surgeons in the condition of the axillary glands. The problem of deciding on the necessity for incising axillary glands was a very difficult one; on the one hand, they formed an important line of defence; on the other hand, if suppurating, they must be opened. He believed that complete immobilisation of the whole limb was a very essential part of the treatment. The formation of pus was to be noted with relief, for pus was an indication of defence, and unless under tension was of no moment. He was not in favour of tubes or packs in his incisions, but he preferred to excise an ellipse of skin and fatty subcutaneous tissue so that drainage was not impeded.

Mr. J. E. H. Roberts (London) said that he would confine himself to the infections of the pulp of the finger in the distal part. He showed that in front of the distal phalanx there was a more or less closed area of loose fatty tissue, down to which ducts of glands reached, the gland often lying in this space. Infections of this part of the finger frequently arrived via the ducts without any prick or injury. The arrangement of the vessels was of great importance, for the artery traversed the space, and the blood-supply to the distal phalanx was arranged in this way. The artery supplying the base of the distal phalanx was given off before the artery entered the space, but those going to the shaft and extremity were given off in the space. This explained why it was that the shaft so often necrosed while the articular end survived. The incision he advised was one which completely opened the space; it was horseshoe-shaped, beginning on one lateral aspect, passing across the tip, and ending on the other lateral aspect. The flap so formed was turned down, and a strip of rubber tissue inserted and the flap replaced. Drainage was rapid and healing perfect. In those cases of acute fulminating streptococcal infections he was not enamoured of hot fomentations, but preferred hot baths for the hand and arm. In cases where the arm became swollen and painful, he thought that a linseed poultice was a very excellent application. In acute teno-synovitis he was entirely opposed to anterior median incisions, and strongly advocated lateral cuts. With regard to the after-treatment, he used hot fomentations for 48 hours, and then used paraffin and flavine dressings. In his opinion there was a widespread tendency to dress too frequently. Early movements were essential, and he agreed with Mr. Max Page that the correct position was one of semi-flexion.

Mr. R. M. Handfield-Jones (London) confined himself to the discussion of the infection of two fascial spaces in the hand occurring as complications in the course of infections of the fingers, these spaces being the middle palmar space and the thenar space. After describing the boundaries and the relations of these spaces he enumerated the avenues of infection.

(a) *Middle Palmar Space.*—This might be infected in one of eight ways: from little finger tendon sheath (if not in continuity); from ring finger tendon sheath; from middle finger tendon sheath; from lumbrical canal of little, ring, or middle finger; from rupture of ulnar bursa; from direct puncture wounds; by lymphatic spread; from thenar space.

(b) *Thenar Space.*—This might be infected by: index tendon sheath; flexor longus pollicis sheath; middle tendon sheath (occasionally); index lumbrical canal; rupture of radial bursa; direct puncture wounds; lymphatic spread; middle palmar space.

The diagnosis was obviously of great importance, for if left untreated the infection would spread in almost every direction except towards the surface. General symptoms were those common to all severe infections. Local symptoms included: (1) Pain, limited to the area of the space involved. (2) Marked tenderness over the area concerned. (3) Swelling, the location and degree of which was the most helpful point in the diagnosis. In the thenar area where there was no dense fascia the thenar eminence became ballooned out; but in the middle palmar space the dense fascia prevented anything like the same degree of distension, although it was enough to obliterate the normal cavity of the palm. Swelling on the dorsum of the hand was a point of great importance. Every infection in the palm caused swelling of the dorsum, the inflammatory process travelling via the lumbrical canals. Except in direct infections of the back of the hand primary dorsal abscesses were extremely rare. This was an important point to remember, because frequently the dorsal swelling appeared to the untrained eye to be the most prominent feature of the case, repeated incisions being made without any improvement whatever to the hand. In 99 per cent. of cases no incision should be made on the dorsum at all, unless to open the thenar space. (4) Position and movement of the fingers which tended to be semi-flexed but could be moved without pain, thus differentiating the condition from an acute teno-synovitis. Treatment consisted of opening and draining the spaces. The middle palmar space was drained by an incision along one of the three lumbrical canals, the canal most obviously affected being chosen, the tendons exposed, and a pair of artery forceps thrust under them, following the lumbrical muscle. The thenar space was opened by an incision on the dorsum on the radial side of the index metacarpal. The after-treatment consisted of hot dressings for 36–48 hours, followed later by dry dressings with the hand immersed in a radiant heat bath for a period of one hour twice in the 24 hours, and a very early institution of movements of fingers, hand, and wrist.

Mr. G. T. Mullally (London) spoke entirely of whitlows of the fingers. He said that anatomically the fingers might be regarded as being composed of three compartments, for the flexion creases of the fingers coincided with fibrous tissue thickenings. In the presence of inflammatory swelling these fibrous thickenings were sufficiently rigid to act as a band strangulating the vessels, and he brought forward the view that the pathology was analogous to that of a strangulated hernia, first the veins being constricted, giving rise to swelling, throbbing and tension, and secondly, the artery being occluded, and necrosis followed. For this reason he was of the opinion that any incision planned to relieve tension in a finger should pass across the next proximal flexion crease to do away with the constriction band. He was still convinced that lateral incisions had no advantages over the anterior median incision which he always practised.

The President said that the surgery of the war had taught many lessons that were applicable to this subject. He thought that of prime importance was the properly placed incision at the earliest opportunity, and he felt very strongly that Willem's mobilisation treatment of infected joints was strongly indicated in septic fingers. Early active movements should be encouraged and maintained. He was convinced that in these cases there was too much splinting and much bad splinting.

Mr. Harold Burrows (Portsmouth) said that he had been worried by septic phlebitis on more than one occasion, and that such complications as metastatic abscesses in hip and knee-joints, &c., were evidence of the presence of a septic thrombosis. He dressed his wounds with a paraffin-flavine dressing.

Mr. M. Mamourian (Ashton-under-Lyne) drew attention to the ugly deformity which resulted after the loss of the greater part of the terminal phalanx, and emphasised the fact that women greatly objected to such an unsightly finger. He was in the habit of inserting an ivory peg exactly the same length as the sequestrated phalanx in such a way that it rested on the base of the phalanx, and was held in position by the flaps of skin being sutured over it. This was a sufficient support to prevent shortening of the flaps until the new bone had regenerated. In the case of the thumb in working men, he advised the insertion of a bone graft, rather than amputation which was the only alternative in certain cases.

Mr. Wilkie briefly replied.

Mr. A. McConnell (Dublin) read a short paper on

Ventriculography,

giving his experiences in certain cases in which he had practised the operation as originally described in America by Dendy. The operation was performed under local anæsthesia, two areas of the skull being exposed. The first site (A), to be used for the injection, was 1¼ inches behind the external auditory meatus, and 1¼ inches above Reid's base line; the second site (B), to clamp the apparatus in position was 1¼ inches behind the external auditory meatus and 2½ inches above Reid's base line. At A the skull was exposed, and a small trephine hole made down to the dura mater: at B only the outer table of the skull was removed in a small circle. A semicircular bar connected the drill end at A, and the pin-holder at B. The pin was screwed tight to the skull, and the whole apparatus then closely applied so as not to shift. At A a perforated metal ball fitted closely to the trephine hole, and through its perforation the cannula was inserted in a straight line with B. The apparatus being thus firmly attached to the head, the patient was removed to the X ray department, and the injection proper begun. Great care was taken that the amount of gas injected was exactly equal to the amount of cerebro-spinal fluid removed. This was done by using a syringe with a two-way tap, sucking out cerebro-spinal fluid first and then injecting oxygen. Mr. McConnell showed excellent radiograms illustrating his results. In all he had performed ventriculography upon 14 cases. Of these five gave no result, and nine gave positive results of internal hydrocephalus, or deformities of the ventricular shadow from tumours,

&c. In two cases out of the 14, sudden death had occurred within 24 hours. In each case the patients appeared well, but suddenly sat up and fell back dead.

Friday, July 27th.

The third day was given up to a discussion on *Anæsthetics from the Surgeon's Point of View* in which both surgeons and anæsthetists took part. The opening paper was contributed by Mr. **Wilfred Trotter**, who began by emphasising the necessity for a close and sympathetic understanding between the surgeon and the anæsthetist in order to secure for the patient the full advantages of modern surgery. He pointed out that since many of the most valuable methods of inducing anæsthesia at the present day—such as the various regional and infiltration methods—were definite surgical procedures in themselves there would probably be in the future a closer approximation of the training of the anæsthetist to that of the surgeon, and a more complete assimilation of the anæsthetist into the surgical team. Such an assimilation would probably go far towards solving some of the difficulties that arose in the relation between anæsthetist and surgeon in operations such as those on the face, pharynx, and upper air passages.

It was clear that in spite of the great progress that had been made within recent years in the subject of anæsthesia there was still no single method capable of general application to all cases. In every individual case the choice of an anæsthetic had to be made from a large number of possibilities, this choice frequently involving very careful consideration. He proposed to discuss in his paper only the methods with which he was himself familiar, classifying them in the three groups of inhalation methods, regional methods, and local methods.

1. *Inhalation Methods.*—(*a*) *Ether* was the nearest approach to an anæsthetic of general use, but with all its advantages it had many drawbacks considered from the broad view of the patient's interests. These drawbacks included the over-stimulating effect of the drug on the circulatory and respiratory activities of the patient, adding seriously to the exhausting effect of the operation. It was irritating to the respiratory organs and to the stomach, leading frequently in the immediately post-operative period to coughing and vomiting; and since the most absolute repose was indicated for at least 24 hours after all serious operations, a liability to cause post-operative vomiting should be looked upon as a grave disadvantage in any anæsthetic method. Ether was also contra-indicated in very severe or long operations which were apt to be followed by much shock. Its advantages were, ease of administration, immediate safety, and profundity of anæsthesia. (*b*) *Chloroform.* The numerous disadvantages of this drug included its immediate danger, the relative lack of depth in the anæsthesia produced, its irritant effects on respiratory and gastric mucous membranes, and its capacity for producing the so-called delayed chloroform poisoning. Chloroform was absolutely inadmissible in infants and children in all circumstances; it should not be used for robust and young or middle-aged adults unless specially indicated; nor should it be used for trivial operations or "casual" anæsthetics. Chloroform was also contra-indicated in young people suffering from acute or chronic infections, in patients suffering from malnutrition or starvation, and in diabetics. In spite of all these disadvantages and contra-indications, however, chloroform was valuable and, indeed, indispensable in certain fields. It produced a smooth and placid anæsthesia: it was useful in cases where any increased turgescence in the respiratory tract was to be deprecated; and it was almost absolutely safe when given through a laryngotomy or tracheotomy opening. Although chloroform was not usually admissible in serious abdominal work, it had a great field of usefulness in operations on the mouth, jaw, larynx, and pharynx, and in his own practice this was the anæsthetic employed in all such cases, almost invariably in combination with laryngotomy or tracheotomy. Chloroform was also valuable in many brain and spine operations and for the radical operation for carcinoma of the breast. (*c*) *Nitrous oxide* was incapable of producing a deep anæsthesia in any but delicate or enfeebled patients unless it was supplemented by local or regional anæsthetisation of the part to be operated upon, its efficacy being also increased by preliminary hypodermic injections of morphine.

2. *Regional Methods.*—(*a*) *Spinal anæsthesia* was unsuited to enfeebled patients and to those with acute and serious abdominal conditions. Its special indications were in operations on the lower limbs, perineum, pelvis, and lower abdomen where shock was to be feared; where metabolic disturbances were to be avoided, as in diabetes; and where full abdominal relaxation was essential. Spinal anæsthesia should generally be preceded by narcotic drugs and might usefully be combined with the use of nitrous oxide. (*b*) *Sacral anæsthesia*, in combination with narcotics, was valuable in operations on the perineum, and was specially indicated in operations for piles. (*c*) *Nerve tissue anæsthesia.* Two special forms of this were in common use; the blocking of the intercostal nerves for operations upon chest and abdomen, and blocking of the brachial plexus above the clavicle for operations on the arm. The complementary use of narcotics and possibly of nitrous oxide should always be considered.

3. *Local Methods—Infiltration Anæsthesia.*—The two chief spheres of usefulness for this method were (*a*) in such conditions as superficial, definitely limited dissections, in radical cure of hernia, especially inguinal and umbilical, and in excisions of the testicle; and (*b*) as a special procedure where other methods were urgently contra-indicated. In the hands of the expert it was capable of application to almost any surgical operation save where diffuse infective conditions were present. The main factors for its successful employment included the preliminary use of narcotics, the injection of an abundance of solution, and allowing full time for its action.

Sir **W. I. de Courcy Wheeler** (Dublin) said that he would have entitled this discussion, "The Anæsthetist and the Surgeon." He was sure that in the minds of all present the picture was vividly present of an emergency abdominal operation with an inefficient anæsthetist—the rigid muscles, the protruded intestines, the harassed surgeon. He did not suggest that the surgeon was always free of blame, for not all surgeons were gentle, and a ruthless hand under the diaphragm could upset any anæsthetised patient, and again, some surgeons were invariably in too great a hurry to begin. Many things went to make a really successful anæsthesia—viz., a consideration of the nature of the operation, the type of patient, the temperament of the surgeon, and a sound judgment throughout. He asked to make three points especially. First there was the patient who, without any obvious cause, collapsed, stopped breathing, and gave all concerned many anxious moments. In these cases the abdomen was usually opened and perhaps an investigation just commenced. Artificial respiration usually had to be resorted to. He wished to stress the fact that all the ordinary methods could not, and should not, be applied. He advocated very strongly a return to the old direct method, by blowing into the patient's lungs. This should be done rhythmically once every four seconds, and very rarely failed. He quoted the classical early example of direct artificial respiration—viz., Elisha and the widow's son. Secondly, he thought that chest complications ought not to be laid at the door of the anæsthetist, for he thought that the rigidity of the diaphragm had much to do with the onset of so-called ether bronchitis and ether pneumonia. He recalled that the late J. B. Murphy had drawn attention to the incidence of acute pulmonary œdema as a complication of operations for large hernias, &c., and had ascribed it to the want of descent of the diaphragm. In many upper abdominal lesions (especially acute ones) the diaphragm was held rigid just as the recti were, and for this reason in doubtful cases he thought that the presence of crepitations at the base of a lung was an indication that the condition was an abdominal one rather than a pulmonary. Lastly, he said that for 20 years he had been in the habit of combining local anæsthesia with general, for the abdominal relaxation obtained was far superior and less general anæsthetic was required. He ended by expressing his complete detestation for chloroform.

Dr. A. L. **Flemming** (Bristol) referred to the somewhat prevalent habit of mutual recriminations that occurred between surgeon and anæsthetist, and he was pleasantly surprised that at this meeting he was not called upon to retaliate in kind. But he was quite certain that there was a very great need for a much closer contact between the surgeon and the anæsthetist. Many points arose which could be settled by consultation, but in so many cases the two seemed poles apart and no combined effort was obtained. He was of the opinion that ether was the most satisfactory anæsthetic if the surgery was gentle, rapid, and dry. He considered that the administration of local anæsthetics by anæsthetists was absolutely useless unless a complete accord existed between them and the surgeon. What was the good, he asked, of an anæsthetist inducing a perfect local anæsthesia for the proposed operation, if the surgeon regarded the patient somewhat in the way that the pathologist does a body awaiting a post-mortem examination? He wished to lay stress upon the fact that the teaching of anæsthetics needed great revision, and should be markedly improved.

Dr. A. E. **Boyd** (Dublin) confined himself almost entirely to colonic anæsthesia. He said that the bad results in this country were due to the use of too high a percentage of ether in the ether oil mixture. He followed Gwathmey's technique very closely except for the mixture. For many months he had used a 50 per cent. ether oil mixture and had had no evil effects. He found it quite safe, very easily controlled, and was followed after operation by a dreamy analgesia. A careful preparation was needed, and consisted of an enema the night before and a rectal irrigation the next morning. The amount to be used must be carefully checked. Of the 50 per cent. mixture he used 1 oz. for each 20 lb. body-weight of the patient. He gave $\frac{1}{6}$ or $\frac{1}{4}$ gr. morphia half an hour before the injection, which had to be given slowly. At least 15 or 20 minutes was necessary for the introduction of the mixture. This mixture did not produce surgical anæsthesia, and here the control came in, for the balance was just tipped over on to the side of surgical anæsthesia by small amounts inhaled from a mask. The period over which the absorption from the large bowel lasted was one and a half hours, so that longer procedures would require rather more inhalation at the end. When the patient returned to bed the colon was washed out, and 2 oz. of olive oil injected. He considered that all head, neck, and breast operations should be done by this method. He also mentioned that all his diathermy cases of the tongue, tonsil, and mouth were done by this anæsthetic.

Mr. A. **McConnell** (Dublin) said that colonic anæsthesia as described by Mr. Boyd was the best he had known, and he did all his operations upon the neck, brain, breasts, and diathermy by this method.

Mr. **Cuthbert** (Gloucester) favoured local anæsthesia for all head cases.

Mrs. **Dickinson Berry** (London) thought that ether anæsthesia if kept light did not produce an undue stimulation, but rather just enough to stand the patient in good stead. She was greatly in favour of combining local anæsthetics with a slight general administration.

Dr. **Basil Hall** (Bradford) said that he was all in favour of simplicity in the administration of anæsthetics, and he mistrusted all the modern apparatus with complicated machinery. No hard-and-fast rules were possible, nor was any apparatus of the least value which dealt only with fixed percentages. What he personally wanted was an anæsthetist who was able to judge each patient separately and deal with according to the condition found. Half the battle in operative surgery was to establish a team with an intimate knowledge of each other. He thought that anæsthesia was often pushed quite unnecessarily far. His experience of ethanesal has been most satisfactory, and he now preferred it to all others. He emphasised the fact that for the patient by far the worst part of an operation was the anticipation of the anæsthetic.

Sir **Crisp English** (London) had three remarks to make. First, he had tried ethanesal for two years with admirable results, and this July he had arranged with his anæsthetist to go back to ordinary ether for one month as a control. There was no doubt in their minds that ethanesal was superior in every respect. Secondly, he advocated the induction, especially in children, by ethyl chloride. The induction is very rapid, and all the long struggling excitable period was omitted, and he thought that in children this was exceedingly valuable. Lastly, he thought that in the hands of such experts as Mr. Boyle, gas and oxygen was an extremely useful anæsthesia, and there were many cases which were safely dealt with by it which would not stand a more toxic drug.

Prof. C. A. **Pannett** (London) drew attention to a condition of delayed ether shock which was not infrequently seen after ether anæsthesia. He mentioned cases leaving the table in good condition only to be in a condition of severe collapse three hours later. He did not find it possible to acquit the anæsthetist of all responsibility for lung complications, though he liked Sir W. I. de Courcy Wheeler's explanation of such cases. And lastly, and most important, he had been attempting lately at St. Mary's Hospital paravertebral nerve-block anæsthesia with good results. The technique was not yet perfected, but it was being made so; he had already done partial gastrectomies, cholecystectomies, &c., under paravertebral anæsthesia.

Mr. **Trotter** briefly replied.

Mr. **Clifford Morson** (London) read a short paper in which he explained his method of, and reasons for, division of the vasa deferentia in operations upon the prostate.

SECTION OF PUBLIC HEALTH.

THURSDAY, JULY 26TH.

This section, which met on two days, was presided over first by Dr. A. **Mearns Fraser** (M.O.H., Portsmouth) and then by Dr. **Lockhart Stephens** (M.O.H., Warblington U.D.). A discussion on factors contributing to the

Recent Decrease in Infant Mortality—

Are such factors likely to be permanent or temporary? —was ably opened by Dr. J. **Wheatley** (M.O.H., Salop). His main conclusion was that the fall of the infant mortality-rate had been due chiefly to education. The earlier part of the fall was probably due to the operation of the Education Act of 1870 in increasing the intelligence of the people and the sense of responsibility of parents. One would not expect an immediate effect from the Education Act but rather an effect delayed for about a generation, and that was what had actually happened, the fall having begun in 1900. The latter part of the fall was probably due to the continued effect of better general education, aided by special education influences, brought to bear more particularly on the mothers, such as by child welfare, tuberculosis and school medical inspection schemes, and by the establishment of district nurses.

Dr. Wheatley's paper was illustrated by tables and charts showing infant mortality rates from 1840 onwards, giving the dates of introduction of various measures likely to affect it. The various possible factors were discussed. The fall in the birth-rate began in 1880, but up to 1900 had not improved infant mortality. The same could be said of the improved sanitation which followed the passing of the Public Health Act of 1875 and coincided with a considerable fall in the general death-rate. The great increase in prosperity and in the purchasing power of the wage which took place in the latter part of the nineteenth century had no effect; in fact, the evidence went to show that improvement in wages without improvement in education and standards of conduct resulted on the whole in more drunkenness, a greater carelessness, lessened natural feeding of infants, and a consequent increase in infant mortality. From 1840 to 1900 the purchasing power was trebled, with no reduction of infant mortality, while from 1900 to 1913 there was a slight decline in purchasing power with a very large reduction in infant mortality.

The removal of slums had been on too small a scale to be an important factor. From 1914 to the present time there had been a cessation of sanitary schemes, a marked deterioration of housing, and a lessened efficiency of sanitary administration, accompanied, nevertheless, by a very marked diminution of infant mortality. He (Dr. Wheatley) did not wish to belittle such important matters as the pollution of the air by smoke, overcrowding, and bad housing, but these were only very specially potent when combined with ignorance and carelessness, and it was this combination which caused the high rates in northern industrial towns. He believed with Dr. Brend that air pollution caused an excess of infant mortality, but there had been no improvement in this respect to account for the reduction in the latter. He did not think the decline was due to an improved milk-supply, in rural districts at any rate, or that the use of dried milk had been sufficiently general to be a large factor.

Ante-natal work was more a thing of the future and had not appreciably affected neo-natal mortality as yet. There was no evidence that the improvement was due to a change in climatic conditions. Between the census of 1901 and that of 1911 there was an increase in the number of married women industrially employed and the figures for 1921 were not yet published. Lessened horse traffic and tarred roads meant fewer flies and more open windows, and had no doubt been among the minor contributory factors. As regards the future, he thought the improvement would be permanent and progressive. If the fall had been due to mild winters or periodicity of infectious diseases, we might have real set-backs, but there was nothing pointing to this, and apart from temporary set-backs caused by epidemics of influenza, measles, whooping-cough, &c., the improvement, in his opinion, would be progressive as long as education kept ahead of material advancement.

In the discussion which followed Dr. H. PECK (M.O.H., Chesterfield R.D.) agreed generally with Dr. Wheatley, but thought privy conversion was one sanitary measure which had had an effect. He also instanced the good effect of "Summer Time" and the cleaner air during the coal strike. Dr. H. B. BRACKENBURY (London) was sceptical as to the good results of maternity and child welfare work. He thought the low mortalities in Connaught, mentioned by Dr. Wheatley, were remarkable, and he suggested the tabulation of districts according to their varying conditions. Dr. D. C. KIRKHOPE (M.O.H., Tottenham) thought the education of the mother in her home was the most important form of education and that the work of the centres was vital. Dr. G. C. TROTTER (M.O.H., Islington) thought home visitation was *the* thing. It was not only the primary education that had been important but the educative effect of working-class movements which operated all through life. Dr. J. W. MILLER (M.O.H., Radnorshire) thought education by health visitors had been important by encouraging breast-feeding. Education in domestic hygiene in schools was not practical. Education in the homes and by centres was extremely important. Dr. G. HARPER PEARCE (M.O.H., Batley) said smoke had increased as infant mortality decreased. Education of the mothers and the use of dried milk had been the chief causes of the decrease. Dr. W. A. BULLOUGH (M.O.H., Essex) thought the district nurse-midwives had been important educators. Dr. H. SCURFIELD (late M.O.H., Sheffield) said the Irish Carnegie report emphasised the freedom of the Connaught mothers from venereal disease and abuse of alcohol. It was also possible that a religion which placed motherhood high had maintained its hold on a population undegraded by the agricultural and industrial revolutions which occurred in England during the reign of George III. He was in general agreement with Dr. Wheatley but attributed more importance to the use of dried milk, and mentioned the opinion of the late Dr. Ewart that the increasing use of a safe milk had been the chief factor. The teaching of housecraft was considered important by many, but always suffered if the Education Committee's estimates had to be cut down. The new midwifery would produce an effect on neo-natal mortality when it got going. Prof. F. E. WYNNE (M.O.H., Sheffield) said an investigation made by him recently showed that most of the Sheffield infant mortality reduction was in diarrhœal diseases. His belief was in the special education of the mothers. The teaching of domestic hygiene in the schools was not a practical form of education.

Dr. WHEATLEY, in replying, said he had limited himself to those factors which, in his opinion, had had a possible effect in causing the decrease in infant mortality. Heredity was obviously not one of these. He could not understand anyone minimising the effect of education. In reply to Dr. Brackenbury he thought the maternity and child welfare schemes had produced a great and immediate effect as contrasted with the delayed effect of improved general education.

Dr. SCURFIELD read a paper on

The Value of Watercress

as a food, and suggestions for its extended use, which evoked considerable interest. In his preliminary remarks Dr. Scurfield drew attention to the proved importance of a vitamin-rich diet not only for laboratory animals but for animals such as pigs, poultry, and dogs kept under ordinary conditions, and the obvious inference that the same held good for human beings if they wanted to be at their best. There was just the danger that people would get sick of the talk about vitamins before they had absorbed the comparatively simple teaching of the newer nutrition—viz., that they needed to include more of the "protective foods"—i.e., milk, green vegetables, and fruits—in their dietaries. Watercress was a green food which had stood the test of time and had a great reputation as a promoter of health. It was certainly, like other cruciferæ, a valuable antiscorbutic. It probably also contained the other two vitamins. He hoped research would be undertaken both as to its chemical and vitamin content. It was a green vegetable, which, like lettuce, was eaten unspoiled by cooking, but which, unlike lettuce, was available all the year round at a moderate price. If there was to be an extended use of it inspection of the sources of supply was desirable. Such inspection would be welcomed by the large growers, who from his experience took great care at the present time with respect to purity of water, &c. In his experience most people, including children, liked it, but many only met it in railway dining cars or as a garnish to chicken, &c., in a restaurant. It was much more used in France, and in his belief its more extended use in this country would be useful in correcting errors in our dietaries due to urbanisation.

FRIDAY, JULY 27TH.

The second day's proceedings opened with a discussion on the

Effect on Health of Sewer Air and Drain Air,

introduced in an interesting paper by Prof. WYNNE, the gist of whose paper was to the effect that the theory of the harmful results caused by sewer and drain air was founded on quite unsatisfactory evidence. Actual infection of human beings by pathogenic micro-organisms carried from the sewage by sewer or drain air was now considered practically impossible, but the theory founded on very flimsy evidence that the inhalation of sewer or drain air lessened the resistance to infection remained.

In the discussion which followed there was a considerable amount of agreement with Dr. Wynne that too great importance had been attached to the harmful effects of sewer and drain air in the past, but the general opinion seemed to be that more research should be undertaken and that we must move cautiously till the subject is better understood. Dr. MEARNS FRASER mentioned that many practitioners attached importance to defective drainage as a cause of certain diseases. He asked why polluted soil did harm if drain air was harmless. Dr. A. WYNTER BLYTH gave the results of experiments conducted by him on the conditions under which micro-organisms can be discharged from sewage into the air. He had experimented with froths, bubbles, and splashes, and had found that a bursting bubble could only throw a micro-organism a distance of 4–6 inches. Whether a micro-organism so thrown could be carried along in a draught of air depended upon whether it was nude or covered with liquid. If nude it might be carried some distance in a light draught. Dr. Blyth advocated further research and that conclusions be not hastily accepted. Dr. SCURFIELD also favoured further research. It would be necessary to convince the Ministry of Health and its architectural department before by-laws could be altered. He had for 20 years advised his health committee that such diseases as typhoid fever and diphtheria could not be caught from drain or sewer air, but that health might be lowered by their inhalation so as to lessen resistance to infection. If drains were not watertight, leakage of sewage into or under the foundations of a house might go on for a considerable time without being spotted. Dr. A. MANKNELL (Bradford) mentioned the widespread belief aroused in the mind of the public by such books as Mr. Teale's, and pointed out that it was very necessary for the general practitioner to have a lead if there was to be a change of front. Dr. J. A. R. GLENNIE (Singapore) thought that the harmful effects put down to drain air might be due to rats. Many other speakers spoke as to the need for caution.

Prof. WYNNE, in replying, said he regarded sewage-polluted ground as a distinct danger. Traps were necessary to make drains rat-proof. Comparing drains with privies, the danger from a privy was not due to the smell, but to flies and the fouling of the streets at emptying times. Medical officers of health required guidance in this matter from scientific research workers like Dr. Blyth. He did not wish to be dogmatic, but we ought not to be satisfied with the vague idea that drain or sewer air lowers health and so causes disease.

Dr. E. B. HAZLETON (Sheffield) followed with a paper on the effect of long-continued inhalation of small doses of

Coal Gas in Causing Ill-health,

and especially in predisposing to tuberculosis. Since his attention had been drawn to the matter he had found that small leakages of coal gas were very common owing to defective construction of the taps. The taps which were at fault were those with stop-cocks at the bottom of the pipe. He had remedied the matter in his own house by adopting a catch which secured a gas-tight tap when the gas was turned off. He attributed the mischief to carbonic oxide, and had found that a leakage, quite insufficient to arouse attention by the characteristic smell, would at the end of the night give rise to a percentage of carbonic oxide in the bedroom, easily detectable by chemical analysis. He believed that the exposure to such air produced headache, anorexia, &c., and ultimately anæmia and he had had several striking cases in which tuberculosis was the ultimate result.

In the discussion which followed most of the speakers agreed that the matter was important and that there was much negligence on the part of householders in securing gas-tight fittings, and the hope was expressed that medical officers of health would follow up this question with a view to seeing if leaky gas taps are as common in their districts as in the experience of Dr. Hazleton.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

We have already commented on the excellence of the exhibition of surgical instruments, appliances, drugs, foods, and other objects which was held in the gymnasium of the Royal Naval Barracks at Portsmouth from Tuesday, July 24th, until Friday, July 27th. In the summary which follows notice is taken of exhibits presenting some new feature, the number of the stand being given for reference in square brackets.

SURGICAL INSTRUMENTS AND APPLIANCES.

The exhibit of surgical instruments, general and special, was particularly full and instructive. [52] John Bell and Croyden, Ltd., incorporating Arnold and Sons (50, Wigmore-street, London, W. 1): showed operating tables and hospital furniture, finished with a special non-chip enamel. Prominence was given to operation and accouchement outfits, to sterilised dressings, and to the "Marylebone" series of sutures and ligatures.—[63] Down Bros., Ltd. (21, St. Thomas's-street, London, S.E. 1): a large selection of new instruments, introduced and modified from existing patterns at the suggestion of operating surgeons, including Albee's instruments for bone grafting, Childe's hernia director and finger guard, Mott's dosimetric intratracheal anæsthesia apparatus, Carruther's saline infusion apparatus with unbreakable vacuum flask, and blood-urea instruments.—[36] The Genito-Urinary Manufacturing Company, Ltd. (66, Margaret-street, London, W. 1): the latest cystoscopes by Thomson Walker, Joly, Kidd, Andrews and Gordon, with urethroscopes by Joly, Powell, Kidd, Harrison and Young, also suprapubic drainage apparatus by Eynard, of Paris.—[65] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, London, E.C.): besides general surgical instruments and hospital furniture, a selection of glass and enamelled ware, a very complete assortment of midwifery bags, and an interesting collection of diagnostic apparatus, including the Holborn "pantoscope" for ear, nose, and throat examination, with additional attachments for trans-illumination of the frontal sinus and examination of the fundus oculi.—[17] Mayer and Phelps (59, New Cavendish-street, London, W. 1): a selection of instruments of original design for general and regional surgery, including the Revel-Moseley electric rotary pump for pressure and suction, available for removing blood and secretions from the operation area and for aspirating the chest and evacuating cysts. Among the intruments were Gillies's instruments for plastic surgery, Platt's chisels for operating in osteo-arthritis, and Walton's support for ptosis and after abdominal section.—[38] John Weiss and Son, Ltd. (287, Oxford-street, London, W. 1): a selection of instruments for use in general and ophthalmic surgery, calling particular attention to a new shadowless lamp for operation purposes.

Among the special instruments:—[29] "Acoustique" (95, Wigmore-street, London, W. 1): the "aid to hearing" in 25 distinct types as well as the acoustique stethoscope for doctors suffering from deafness, and an installation to enable deaf members of a congregation to hear the service.—[3] H. E. Curtis and Son, Ltd. (8, Old Cavendish-street, London, W. 1): various forms of abdominal belt and support, including an arrangement for colostomy, as well as "colonol," a liquid paraffin of Russian origin with a S.G. of 0·885 and viscosity of 295 to 300 secs. at 100° F.—[11] The Dowsing Radiant Heat Co., Ltd. (91, Baker-street, London, W. 1): the latest form of apparatus for radiant heat treatment by apparatus which is supplied on hire to medical men and institutions for any length of time.—[28] Horace V. Duncan (117, Commercial-road, Portsmouth): a number of original designs in artificial limbs, the "Victor" models being especially light in weight as well as silent and perfect in movement.—[19] Lindsay and Sons (7, Commercial-road, Portsmouth): abdominal belts, electric trusses, artificial limbs, appliances, and dressings as supplied to the Royal Portsmouth Hospital.—

[6] Watson and Sons (Electro-Medical) Ltd. (43, Parker-street, Kingsway, London, W.C. 2): the "Sunic" X ray outfit for private practitioners and cottage hospitals, an oil immersed transformer type employing a 30 milliampère Coolidge tube in conjunction with a combined couch and screening stand.—[9] X Rays Limited (11, Torrington-place, London, W.C. 1): the latest design of combined couch and screening stand, affording complete protection for Coolidge tube to comply with the standard set up by the X Ray and Radium Protection Committee. The ends of the box are covered with 9 mm. lead rubber, the sides with 3 mm. of the same, and outside all is a layer of 3 mm. of metallic lead.

Besides those firms mentioned as supplying dressings:—[33] Antiphlogistine (Denver Chemical Mfg. Co., London, E. 3): the well-known product in the nature of a hygroscopic antiseptic poultice, non-irritating and non-toxic, keeping well in any climate and ready for immediate use.—[14] The Thermogene Company, Ltd. (Haywards Heath, Sussex): A scientifically prepared cotton-wool impregnated with stimulating medicinal essences adapted for use as an analgesic and counter-irritant.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

The collection of drugs and pharmaceutical preparations was large and representative:—[2] Allen and Hanburys, Ltd. (37, Lombard-street, London, E.C. 3): therapeutic sera and vaccines issued by the Lister Institute, as well as a number of organo-therapeutic products, insulin, A.B. brand (manufactured jointly with British Drug Houses, Ltd.), a complete range of group-test protein solutions to be used in the diagnosis of hay fever, urticaria, &c., an efficient spirochæticide in the form of novarsan, and "butyn" a new local anæsthetic not coming within the scope of the Dangerous Drugs Act. The same firm also showed surgical instruments and appliances.—[69] Anglo-French Drug Company, Ltd. (238a, Gray's Inn-road, London, W.C. 1): special pharmaceutical preparations such as diabetylin for the treatment of diabetes without the withdrawal of carbohydrates, dimol, the intestinal disinfectant introduced by Captain Ainslie Walker: galyl, an arsenical compound for syphilis, approved by the Ministry of Health, and neo-trepol, an antisyphilitic containing 96 per cent. of bismuth in isotonic medium.—Modern Pharmacals, Ltd. (2, Calthorpe-street, London, W.C. 1): glucarsenol, a solution of novarsenobenzol in glucose with analgesics, in ampoules ready for use.—[45] Bayer Products, Ltd. (1, Worple Way, Acton Vale, London, W.): a large collection of synthetic drugs, among them adalin, a hypnotic and sedative, for use in neurasthenia, cardiac neuroses and pertussis, luminal and luminal-sodium, sedatives in epilepsy, chorea and drug habit, novaspirin, protargol, sajodin, tannigen, veronal, and a preparation designed to stimulate fibrosis in tuberculous conditions, known as guycose, being a 5 per cent. solution of guaiacol-calcium-sulphonate in liquid somatose.—[67 and 68] John Bell and Croyden Ltd.: a display of "ramul" and "ramulettes," the ready-for-use barium meal in X ray diagnosis, B and C brand of lysol, and "malobin," a children's tonic, being a combination of colloidal iron, red bone-marrow, and malt extract.—[12] Boots Pure Drug Company, Ltd. (Nottingham): a large assortment of synthetic and medicinal chemicals, including acriflavine in crystalline form; stabilarsan, being a stable combination of salvarsan and glucose; alanin, uradal and others; compressed tablets of medicinal drugs and chemicals; solution tablets in distinctive form for external application; flexible capsules and pastilles.—[17] C. J. Hewlett and Son, Ltd. (35, Charlotte-street, London, E.C. 2): a series of original preparations, including deliciol, a soft paraffin for intestinal lubrication, iodermiol, a non-staining preparation of iodine; physiologically standardised tinctures of ergot, digitalis, cannabis indica, scilla and strophanthus, and a hypnotic, somnogen, an opium preparation free from disagreeable after-effects.—[40] Newton, Chambers and Co., Ltd. (331, Gray's Inn-road, London, W.C. 1): izal disinfectants, powders, soaps, along with mechanical sprayers.—[42] Oppenheimer Son and Co., Ltd. (179, Queen Victoria-street, London, E.C. 4): palatinoids and pulverettes, a series of colloids known as "oscols," standardised both microscopically and bacteriologically, roboleine, a reconstructive food for infants and invalids, and "pinheroin," a combination of terpene, heroin, and Canadian pine for use in laryngitis and chronic bronchitis.—[66] Parke, Davis and Co. (50, Beak-street, Regent-street, London, W. 1): pharmaceutical preparations including adrenalin gauze tape, medicinal peptone for use in cases of hypersensitiveness, mercurosal, a soluble organic mercury for injection, and protein extracts for diagnosis in more than 100 forms; also bacterial vaccines prepared at St. Mary's Hospital and antidiphtheritic serum of high concentration.

A number of special pharmaceutical preparations were shown. [81] The Anglo-American Oil Co., Ltd., Albert-street (Camden Town, London, N.W. 1): nujol, an intestinal lubricant of undeviating standard of viscosity; miscol, a solution of menthol, camphor, and eucalyptol in liquid paraffin for use in an atomiser in catarrhal affections and hay fever.—[56] Armour and Company, Ltd. (Queen's House, Kingsway, London, W.C. 2): digestive ferments, glandular preparations, and a glycerine extract of red bone marrow.—[41] G. W. Carnrick Co.'s standardised gland products (American Drug Supply Co., Ltd., 40, Lexington-street, London, W. 1): a series of organo-therapeutic products, selected from the glands of healthy food animals, such as hormotone for menstrual and menopausal disorders, trypsogen for diabetes mellitus, secretogen for gastro-intestinal disorders, and kinazyme in malnutrition.—[78] The Crookes Laboratories (22, Chenies-street, London, W.C. 1): along with other colloidal products, the recently introduced collosol-calcium for use in tuberculosis, malnutrition, and chronic sepsis, and collosol-kaolin in the treatment of intestinal toxæmia.—[20] The Danish Medicinal and Chemical Co., Ltd. (John Morgan Richards and Sons, Ltd., 46, Holborn Viaduct, London, E.C. 1): a concentrated pepsin-extract prepared and standardised by Dr. Ege, of Copenhagen University, citric acid tablets for achlorhydria, and various soft-mass pills containing an assimilable form of iron known as ferrolyt.—[13] J. C. Eno, Ltd. (Victoria Embankment, London, E.C. 4): a well-known effervescent saline laxative to assist in correcting some of the inevitable consequences of a civilised and artificial life.—[34] Genatosan, Ltd. (Loughborough): sanatogen, a true organic compound of casein and sodium glycerophosphate: genasprin, a pure form of acetyl-salicylic acid, cystopurin, and detoxicated vaccines including protein fractions of various bacteria.—[48] Jeyes' Sanitary Compounds Co., Ltd. (64, Cannon-street, London, E.C.): preparations of cyllin, characterised by high bactericidal power and slight toxicity, including inhalation, capsules, pastilles, dusting powder, and surgical soap: also Jeyes' lysol (jeysol), for use when a clear solution in water is required.—[44] The Chas. H. Phillips Chemical Co. (179, Acton Vale, London, W. 3): milk of magnesia, an antacid containing not less than 26 fluid grains of magnesium hydrate to the ounce, for use in milk modification and as a mild aperient; phospho-muriate of quinine compound, being an aromatic syrup for use as a general and nerve tonic.—[83] The Sandoz Chemical Co., Ltd. (Canal-road, Bradford): scillaren, being the cardiotonic glucoside of squill in tablets and ampoules: femergen, a new preparation of ergot free from unpleasant taste or smell; felamine, a combination of biliary acids of ox gall and hexamine for affections of the biliary system.—[82] Savory and Moore, Ltd. (143, New Bond-street, London, W. 1): the well-known food containing vitamins and approximating closely in composition to human milk: a new anæsthetic, ethanesal, containing ketones treated with CO$_2$ and ethylene dissolved in ether, and the fructole series of pharmaceutical preparations flavoured with a fruit base.—[23] The Semprolin Company, Limited (18, Leather-lane, London, E.C. 1): an emulsion containing

60 per cent. of paraffin oil of high viscosity; a special emulsion for infants with addition of carminatives known as carmex, and O.T.P., an oxygenated toothpowder with a soluble base giving off nascent oxygen when moistened.

Toilet preparations were shown by several firms.

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(To be continued.)

Obituary.

FLORA MURRAY, C.B.E., M.D., B.S. Durh., D.P.H. Camb.

Dr. Flora Murray, who died in London after a short and unexpected illness on July 28th, will be remembered for her large share in founding and maintaining the Women's Hospital Corps.

Flora Murray came from Dumfriesshire where her family have lived for over 500 years. Her father was Commander John Murray, R.N., of Murraythwaite, and her brother, the late Major Murray, was M.P. for Dumfries county. A student of the London School of Medicine for Women and of the College of Medicine, Newcastle-upon-Tyne, Dr. Murray graduated in medicine and surgery at Durham in 1903, proceeded to the M.D. degree in 1905, and a year later took the D.P.H. at Cambridge. Among the various appointments which she held after qualification were those of assistant physician to the Crichton Royal Institute, Dumfries, clinical assistant at the Belgrave Hospital for Children, and anæsthetist to the Chelsea Hospital for Women. She entered upon general practice in Kensington, throwing herself into her professional work with characteristic energy and devotion. In 1911 she founded a hospital for children in the Harrow-road, consisting of an out-patient department which extended rapidly, and of a ward of 12 beds. It was her hope later to build and to raise an endowment for an adequate hospital as a training centre for medical women in children's medicine. But the war intervened and expansion proved impracticable. Greatly to her regret, and that of the committee which she had gathered round her, the hospital was closed in 1921, after having done valuable work for ten years. The money collected for the hospital, mainly by her own efforts, amounted to £31,000, and has now in large part been vested in a trust under the name of "The Sea and Sun Club" for providing holidays and convalescent treatment for children of the neighbourhood.

A few days after war broke out in August, 1914, Dr. Murray offered her services first to the British War Office and then to the French Red Cross, and with other medical women she organised a women's unit for service in France. During the first six months of the war she helped to collect funds for and commanded two voluntary hospitals, each of 100 beds, first at the Hotel Claridge in Paris and then at Wimereux, near Boulogne. In 1915 Sir Alfred Keogh, Director-General of Medical Services, offered her the command of a larger military hospital in London and, from this time, the Women's Hospital Corps served under the British War Office. St. Giles's Workhouse, Bloomsbury, was placed at her disposal and, with the rank of lieut.-colonel, Dr. Murray became doctor in charge of the Military Hospital, Endell-street, with 600–700 beds, in addition to two auxiliary hospitals in the vicinity of London. The story of this admirable work is told with modesty and humour by Dr. Murray herself in "Women as Army Surgeons" (Hodder and Stoughton).

Her friend and colleague, Dr. Louisa Garrett Anderson, writes: "Dr. Flora Murray shared the pride and the humility, the traditions, and the love of country which are the inheritance of an old family. She was singularly fitted for the rôle of wise physician. Reticent and tactful, with wide sympathy and good judgment, grace of mind and body combined to give her a place in many hearts and her practice grew. She believed in youth and she gathered round her at Endell-street a company of young women and girls who justified her pride by their beauty and ability, and the fidelity with which they discharged the tasks she committed to their care. She had the power to lead women and to call out in others courage and self sacrifice equal to her own.

From a portrait by Mr. Francis Dodd.

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Dr. Flora Murray died in her fifty-fourth year. The funeral took place at Penn Church on August 1st, when a personal address was given by the Rev. William R. Rice, of the West London Mission, who during the war had acted as Wesleyan chaplain to the Endell-street Hospital. Sir William Leishman, D.G.M.S., represented the War Office, and the large gathering of friends included representatives from the

Royal Free Hospital, the Elizabeth Garrett Anderson Hospital, the London School of Medicine for Women, the London Association of Registered Medical Women, the Women's Freedom League, and the West Islington Infant Welfare Centre. A number of the women who had worked under Dr. Murray as orderlies and nurses also were present.

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MEDICAL CHARITIES.

To the Editor of The Lancet.

Sir,—The remarks of the treasurer of the British Medical Association at its annual meeting, reported in your last issue (p. 229), will, I hope, bring home to the medical profession the needs of the Royal Medical Benevolent Fund. Dr. G. E. Haslip's comments call for some reply, and especially for information as to the efforts that are being made by the committee of management to increase the income of the Fund. Dr. Haslip is (as he stated) a member of this committee and as such has a voice in the management. It is a matter of regret that owing to his many engagements and his recent illness he has not been able to attend as often as we could wish. The Medical Agency, of which Dr. Haslip is chairman, has contributed most handsomely to the Fund. These gifts have been acknowledged with gratitude not only by the committee of management and in the medical press, but by special letters from the treasurer.

The subscriptions collected through the medium of the Association amounted last year to £800. Moreover, through the kindness of the Editor of *The Lancet* and the Editor of the *British Medical Journal*, a summary of grants made is published monthly. Those who read their journals cannot but be informed of the existence and the needs of the Fund. The conference to which Dr. Haslip refers took place in 1922 at the request of the officials of the British Medical Association and was attended by representatives of Epsom College and of the Royal Medical Benevolent Fund. Dr. Haslip proposed that the two bodies should be amalgamated and that there should be a central bureau for the collection of subscriptions.

This proposal did not meet with the approval of either body as it involved the abandonment of organisations, metropolitan and provincial, for the collection of funds that had been built up by years of patient endeavour, without any sufficient assurance of their adequate replacement—and in the case of Epsom College there was the additional objection that such action would tend to restore to the College an [illegible] which is a general public school of the ordinary [illegible] a charitable aspect, that had been [illegible] harmful to the College, as well as [illegible] foundation incorporate in it. [illegible] years ago was an important [illegible] council of Epsom College to obtain [illegible] of Parliament. It was felt [illegible] Epsom College and the Royal [illegible] Fund were [illegible]

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THE King has sanctioned the promotion from Hon. Associate to Knight of Grace of Surg. Lieut.-Colonel Evan Evans, T.D., in the Order of the Hospital of St. John of Jerusalem in England.

BLENDING BUTTER AND MARGARINE.—An important case relating to the blending of butter and margarine was decided at the Salford Police Court on August 1st. The defendants were the Ballochmyle Creamery Co., Ltd., of Ayrshire. The prosecutor proved that a sample of the blend bearing the label "Ayrshire margarine rolls blended with pure butter," for which an inspector had paid 1s. a pound, contained only 1 per cent. of butter, the prosecution contending that notwithstanding the description, the article was nothing but margarine and should have been sold as such. It would appear that legally, while it is permissible to mix with margarine butter not exceeding 10 per cent., the article even in that case had to be sold as margarine. The general price of margarine in Salford where the sample was bought was 6d. per pound, and on the specific date butter was 1s. 4d. per pound. The stipendiary magistrate said that 1 per cent. of butter was not sufficient to make him think that it was fair to the purchaser, and imposed a fine of £20. Leave to appeal was granted.

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Dr. Haslip's effort in the cause of education and of charity was cordially appreciated by both bodies, and I hope will not be lost upon the profession. That the executive have not been idle in developing new ideas and methods during the last few years, the following brief account will indicate and will go some way, I hope, to remove the impression of apathy conveyed in Dr. Haslip's remarks. It is an error into which he could not have fallen had he been in closer touch with the management. During the last two years special appeals have been issued in the following towns: Bath, Birmingham, Bolton, Bristol, Bromley, Birkenhead, Bury, Cambridge, Cornwall, S. Wales and Mon., Surrey, Devonshire, Bootle, Manchester, 60 per cent. of paraffin oil of high viscosity; a special emulsion for infants with addition of carminatives known as carmex, and O.T.P., an oxygenated tooth-powder with a soluble base giving off nascent oxygen when moistened.

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Dr. Flora Murray, who died in London after a short and unexpected illness on July 28th, will be remembered for her large share in founding and maintaining the Women's Hospital Corps.

Flora Murray came from Dumfriesshire where her family have lived for over 500 years. Her father was Commander John Murray, R.N., of Murraythwaite, and her brother, the late Major Murray, was M.P. for Dumfries county. A student of the London School of Medicine for Women and of the College of Medicine, Newcastle-upon-Tyne, Dr. Murray graduated in medicine and surgery at Durham in 1903, proceeded to the M.D. degree in 1905, and a year later took the D.P.H. at Cambridge. Among the various appointments which she held after qualification were those of assistant physician to the Crichton Royal Institute, Dumfries, clinical assistant at the Belgrave Hospital for Children, and anæsthetist to the Chelsea Hospital for Women. She entered upon general practice in Kensington, throwing herself into her professional work with characteristic energy and devotion. In 1911 she founded a hospital for children in the Harrow-road, consisting of an out-patient department which extended rapidly, and of a ward of 12 beds. It was her hope later to build and to raise an endowment for an adequate hospital as a training centre for medical women in children's medicine. But the war intervened and expansion proved impracticable. Greatly to her regret, and that of the committee which she had gathered round her, the hospital was closed in 1921, after having done valuable work for ten years. The money collected for the hospital, mainly by her own efforts, amounted to £31,000, and has now in large part been vested in a trust under the name of "The Sea and Sun Club" for providing holidays and convalescent treatment for children of the neighbourhood.

A few days after war broke out in August, 1914, Dr. Murray offered her services first to the British War Office and then to the French Red Cross, and with other medical women she organised a women's unit for service in France. During the first six months of the war she helped to collect funds for and commanded two voluntary hospitals, each of 100 beds, first at the Hotel Claridge in Paris and then at Wimereux, near Boulogne. In 1915 Sir Alfred Keogh, Director-General of Medical Services, offered her the command of a larger military hospital in London and, from this time, the Women's Hospital Corps served under the British War Office. St. Giles's Workhouse, Bloomsbury, was placed at her disposal and, with the rank of lieut.-colonel, Dr. Murray became doctor in charge of the Military Hospital, Endell-street, with 600–700 beds, in addition to two auxiliary hospitals in the vicinity of London. The story of this admirable work is told with modesty and humour by Dr. Murray herself in "Women as Army Surgeons" (Hodder and Stoughton).

Her friend and colleague, Dr. Louisa Garrett Anderson, writes: "Dr. Flora Murray shared the pride and the humility, the traditions, and the love of country which are the inheritance of an old family. She was singularly fitted for the *rôle* of wise physician. Reticent and tactful, with wide sympathy, and good judgment, grace of mind and body combined to give her a place in many hearts and her practice grew. She believed in youth and she gathered round her at Endell-street a company of young women and girls who justified her pride by their beauty and ability, and the fidelity with which they discharged the tasks she committed to their care. She had the power to lead women and to call out in others courage and self sacrifice equal to her own.

From a portrait by Mr. Francis Dodd.

DR. FLORA MURRAY.

"No account of Dr. Flora Murray would be complete without reference to the part she took in the struggle for the emancipation of women. Inevitably, she was a suffragist and, as inevitably, when she deemed militancy necessary, a militant suffragist. She was an admirable committee member, a good public speaker, and a keen politician. Her sympathies were strong and tender—for animals, for children, for working women, indeed for all women in their aspiration for freedom and opportunity; and the 32,000 men who passed through her hands during the war received their share of consideration and comradeship."

Dr. Flora Murray died in her fifty-fourth year. The funeral took place at Penn Church on August 1st, when a personal address was given by the Rev. William R. Rice, of the West London Mission, who during the war had acted as Wesleyan chaplain to the Endell-street Hospital. Sir William Leishman, D.G.M.S., represented the War Office, and the large gathering of friends included representatives from the

discovery, Yamagiwa and Schikawa of the University of Tokyo. An account of the experiments by which they produced cancer in animals by the application of coal tar, externally and by injection, is available in the *Journal of Cancer Research*, January, 1918. Bloch and Driefuss were conducting researches on the effect of coal tar in the production of cancer in 1912 and resumed the work in 1920. In mice they produced cancer with the whole tar and also with some of its different elements. They claim to have isolated the cancer-producing constituent of the tar.[1] They had been, however, forestalled by the Japanese. If it be true as you say in your leading article that probably within the next few years we may see "results in the diagnosis and treatment of malignant disease which could not have been foreshadowed a very few years ago" and these results are achieved along the lines you suggest, then I think it should be clearly understood that the discovery that made this advance possible was the experimental production of primary cancer in laboratory animals.

I am, Sir, yours faithfully.
CHARLES WALKER.
University of Liverpool, July 30th, 1923.

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

To the Editor of THE LANCET.

SIR,—A not inappropriate comment on Mr. Percy Flemming's letter in THE LANCET of last week, relative to the use of the ophthalmoscope in general practice, may be found in a sentence written more than 50 years ago by the distinguished physician who is now the Regius Professor of Physic in the University of Cambridge. The sentence runs: "Every medical *school is now* . . . . bound to teach its students the use of the ophthalmoscope as carefully as the use of the stethoscope is taught." The task which Sir Clifford Allbutt accepted in 1871 Mr. Flemming in 1923 proposes to abandon. This is the more astonishing seeing that the difficulties of the earlier date have been largely reduced by the introduction of the electric ophthalmoscope, and yet I should be inclined to accept Mr. Flemming's conclusion if, as he appears to decide, instruction and practice in the use of the ophthalmoscope must be limited to the brief period spent by the student in the ophthalmic department. If, however, the exhortation conveyed in Sir Clifford Allbutt's comparison is accepted, no such limitation can be allowed. For the use of the stethoscope is taught by compelling the student to practise the instrument on every patient, as in this way alone can he acquire the auditory standard which enables him to recognise both the limits of the normal and departures, slight or gross, from the accepted level. And when in the medical wards and out-patient service the ophthalmoscope is taught and practised as the stethoscope is taught and practised—and the enterprise is easily accomplished—the student will become as expert with the one instrument as with the *other*. With neither can he be expected to appreciate, without a long experience, the finer shades of change produced by disease. But in each instance he is provided with an opportunity for the self-education which is the avenue to expert judgment, and if the medical curriculum affords and enforces this opportunity it has largely fulfilled its duty. To abandon the ophthalmoscope as beyond the scope of general practice because all its values cannot be obtained in some few weeks passed in an ophthalmic department would be as reasonable as to abandon the stethoscope because, even at the end of the curriculum, not all its possibilities have been acquired. Let the fashion of instruction in the one case be equally applied to the other, and there can be no doubt that with each there will be one and the same standard of success.

I am, Sir, yours faithfully.
London, W., August 6th, 1923. C. O. HAWTHORNE.

PHYSICAL AND RECREATIONAL TRAINING.

To the Editor of THE LANCET.

SIR,—As one of those who were privileged to be present at the demonstration of physical and recreational training held before the B.M.A. at their recent meeting in Portsmouth, an account of which was given in your issue of last week, may I express the hope that the benefit of this kind of training shall not remain confined to the Navy. I suppose we most of us feel that our board school education fails to develop certain sentiments and elements of strong character which the Naval School of Physical and Recreational Training has managed to include.

It is to be hoped, therefore, that the principles involved will not be lost to sight by the educational authorities of this country, but that steps will be taken with the object of founding a national school of physical and recreational training, so that there may be gradually accumulated an ample supply of skilled instructors. For while there is an unquestionable need for this particular kind of training among the masses, it can be satisfactorily carried out only by teachers who have themselves undergone a thorough course of practical instruction in the principles upon which the system is based.

I am, Sir, yours faithfully.
Southsea, August 2nd, 1923. HAROLD BURROWS.

AN EPIDEMIC OF ERYTHEMA NODOSUM.

To the Editor of THE LANCET.

SIR,—With reference to the annotation on this subject in THE LANCET of July 28th (p. 180), giving details of Prof. E. Ledoux's paper in the *Revue de Médecine*, may I call the attention of your readers to an instructive monograph on erythema nodosum by Dr. A. A. Lendon of Adelaide? It is a little unfortunate, perhaps, that the author gave it the title of "Nodal Fever" (1905). For that reason it may have been overlooked by those interested in the subject. Dr. Lendon came to the conclusion as a result of special observation that the condition was *sui generis*, and, from what I have observed, I am inclined to agree with Dr. Lendon.

I am, Sir, yours faithfully.
London, W., August 3rd, 1923. GEORGE PERNET.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. M. P. Jones is placed on the Retd. List with the rank of Surg.-Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

The Royal Naval Volunteer Reserve Officers' Decoration has been conferred upon Surg.-Capt. A. R. Brailey.

The undermentioned appointments are made at the War Office: Lt.-Gen. Sir W. B. Leishman, F.R.S. (late R.A.M.C.), to be Director-General vice Lt.-Gen. Sir T. H. J. C. Goodwin (late R.A.M.C.), who is placed on retired pay.

ROYAL ARMY MEDICAL CORPS.

Maj. W. Davis to be Lt.-Col., vice Lt.-Col. G. H. Goddard (ret. pay).

Temp. Capt. T. Brodie relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Capt. T. S. Goodwin (late R.A.M.C.) to be Capt.

D. R. Lewis and T. D. Overend to be Lts.

General Hospitals: The undermentioned relinquish their commns. and retain their rank except where otherwise stated: Capts. G. M. Benton (granted the rank of Maj.), J. P. Buckley, E. Moir (granted the rank of Maj.), T. P. McMurray, and H. H. Rayner.

ROYAL AIR FORCE.

Squadron Leader F. C. Jobson is transferred to Reserve, Class D.2.

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[1] Schweizerische Med. Woch., Basle, 1921, No. 45, 51.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Adjournment of Parliament.

PARLIAMENT adjourned on Thursday, August 2nd, for the summer recess. It will reassemble on Nov. 13th.

HOUSE OF LORDS.

WEDNESDAY, AUGUST 1ST.

Dentists Bill.

The Dentists Bill was read a third time and passed.

HOUSE OF COMMONS.

WEDNESDAY, AUGUST 1ST.

Public Health.

On the motion for the third reading of the Consolidated Fund Bill,

Mr. RHYS DAVIES asked the Minister of Health whether he had any further information relative to the shortage of hospital accommodation in this country. While there were 30,000 empty beds in the Poor-law hospitals there were not many short of 100,000 people waiting for admission to the ordinary hospitals. In one London hospital there were 300 persons on the waiting list for 15 beds. He did not blame the Minister for this state of things, but he thought it was his duty to carry out the recommendations of the 1921 committee of inquiry. He wished to protest against the action of certain employers in Gloucester who had given notice of dismissal to their employees who refused to be vaccinated. He hoped that the Minister would come to the rescue of these people who objected to vaccination, because some people thought that the whole thing which had been boosted in the press as a small-pox scare was merely a "stunt" on behalf of some newspapers. The Minister of Health had received a deputation that week from the Lancashire Insurance Committee supported by Members of the House relative to an arrangement which it was suggested should be made between Mr. Spahlinger and the Ministry of Health. He was sorry to learn that the result of the negotiations so far was not very encouraging. He thought that the Minister would agree that the treatment of consumption had reached a deadlock. Sanatorium treatment after all was merely a treatment to ward off the disease. The deputation asked the Minister to support Mr. Spahlinger by way of a grant or subsidy and not only by way of purchasing the serum. He believed that the Minister had gone so far as to say that he was prepared to set aside a separate institution with 40 or 50 patients upon whom experiments could be made with the new treatment, but Mr. Spahlinger was not able financially to accept an agreement of this kind. He appealed to the Minister to come to Mr. Spahlinger's aid.

Mr. MARCH said that in his district there had been a big increase in tuberculosis since the war and they had had the sanction of the Ministry of Health to have two doctors to attend to the patients. But during the summer holidays they had only one doctor instead of two. The consequence was that the patients had to be neglected for two months. They were also informed that extra nourishment was not to be granted to these patients. They were also informed that they were not to spend so much money in milk at their maternity and child welfare centres. He hoped that the Minister would help those local authorities who desired to do all they could to keep the people healthy.

Lieut.-Colonel HODGE said that the Spahlinger cure had proved efficacious in 80 per cent. of the cases treated. Mr. Spahlinger, however, was in difficulties to the extent of about £100,000. But only £24,000 of that amount was pressing. But for the sum of £100,000 they could obtain his laboratory, the whole of his estate, his father's estate, which was at present in the hands of the bank on mortgage. Mr. Spahlinger was willing to hand them over on trust for ten years. He only asked further for a sum of money to allow him to continue his research. He had gone the length of saying that they might appoint a committee to record how the money was spent. For the sum of £100,000 and a subsidy of £10,000 a year for three years Mr. Spahlinger was prepared to give the Minister of Health 50 per cent. of his sera and his vaccine.

Lord EUSTACE PERCY, Parliamentary Secretary to the Ministry of Health, said that on Jan. 1st the number of empty beds in the Poor-law infirmaries was just over 6000, or about 18 per cent. Considerable steps were being taken all over the country for the better organisation and utilisation of the space in the Poor-law infirmaries. As regarded the point about employers and vaccination in Gloucester, if he were in that town he should certainly claim the right to protect his household from risk by refusing to take into his private employment any person who was not vaccinated, and he should regard it as a gross form of tyranny if the State told him not to do so. There was a grant at any rate in certain cases and areas for extra nourishment for people suffering from tuberculosis. In regard to Mr. Spahlinger the Ministry of Health sent out a specially qualified officer to Switzerland in 1922, and on receipt of that officer's report the Ministry, in August last year, made a proposal to Mr. Spahlinger which he was unable to accept. Arrangements made between the Red Cross Society and Mr. Spahlinger also fell through. This year there had been a renewal of the negotiations and the Minister had seen Mr. Spahlinger. The position was this. The Government were interested in the Spahlinger treatment and they were satisfied that there was a prima facie case for such further scientific inquiry as would enable medical authorities and the world in general to form a definite and final opinion as to its efficiency. But if there was to be any question of the expenditure of public funds Parliamentary sanction would be necessary, and the Government would not be justified in asking for such sanction except on the basis of adequate information and reasonable security. In the opinion of the Minister of Health these conditions could best be satisfied by asking Mr. Spahlinger to take an early opportunity of making a full statement of his process and results to a body competent to pass expert opinion upon it. His right hon. friend understood that such an opportunity was being afforded in this country, and when Mr. Spahlinger had taken advantage of it it should be possible to arrive at a decision as to what action, if any, could appropriately be taken by the Government. Meanwhile the Minister hoped that the appeal which was now being made for funds from private sources might be successful in meeting the immediate difficulties of Mr. Spahlinger's position.

The Bill was read a third time.

Cost of Inmates of Poor-law Institutions.

Mr. CECIL WILSON asked the Minister of Health the annual cost per head for England and Wales of the inmates of Poor-law institutions, distinguishing between children's homes, infirmary, and other inmates respectively.—Mr. NEVILLE CHAMBERLAIN replied: The annual cost per head for the year ending March 31st, 1921, for England and Wales of the inmates of the several classes of Poor-law institutions was as follows:—

	£	s.	d.
Homes for children	73	18	7
Poor-law infirmaries and other Poor-law institutions for persons suffering from infirmity of body or mind	148	12	1¼
General Poor-law institutions	78	14	7½
All classes of Poor-law institutions	88	5	3¼

Venereal Disease Disinfectants.

Mr. PETO asked the Minister of Health whether he had consulted the Law Officers of the Crown as to the effect of the Venereal Disease Act, 1917, in connexion with the report of the committee of inquiry on venereal disease under the chairmanship of Lord Trevethin; and, if so, whether he could give the House their opinion as to the position of chemists under the Act and the necessity for legislation, if effect was to be given to the recommendations in Clause 14 of the committee's report.—Mr. NEVILLE CHAMBERLAIN replied: I have consulted the Law Officers of the Crown as to the effect of Subsection 2 of Section 2 of the Venereal Disease Act, 1917, and I am advised by them that there is nothing in that subsection to prevent a chemist from selling disinfectants for the prevention of venereal disease where no written or printed instructions are affixed to or delivered with the disinfectant, or from giving verbal recommendations of medicinal preparations intended to be used or applied for the purpose. In the light of this opinion it would appear that legislation would be necessary in order to permit written or printed instructions to be supplied with the disinfectant or to restrict the existing powers of chemists by confining them to the sale of articles, the composition of which had been approved by a competent authority.

Deaths from Measles.

Sir ROBERT NEWMAN asked the Minister of Health if the deaths resulting from measles had increased since the compulsory notification of that complaint had been abolished.—Mr. NEVILLE CHAMBERLAIN replied: There has been no such increase. The average number of deaths from measles during the past three years has been 5012 per annum as compared with 7318 per annum for the four years, 1916 to 1919, during which the notification of measles was compulsory throughout the country.

Advertisements on Medical Certificates.

Mr. RAINE asked the Minister of Health if he was aware that there were large stocks of certificates with advertisements on the reverse side in the hands of some of the industrial insurance companies; and would he, in view of the strong exception taken by the medical profession to such certificates being issued, cause these stocks to be replaced by the new certificates which were now being printed.—Mr. NEVILLE CHAMBERLAIN replied: The hon. Member has been misinformed. Certificate books are issued to insurance committees and not to approved societies. A new supply without advertisements will be available shortly, but I cannot undertake to withdraw the books already issued to practitioners.

Vaccination and Small-pox.

Mr. LEACH asked the Minister of Health whether he had any official information that it was the practice in the United States to carry out vaccination by means of a single insertion only, and had it been found that this method was as protective against small-pox as the official four marks method adopted in this country.—Mr. NEVILLE CHAMBERLAIN replied: I have no official information as to the method of vaccination in the United States of America. The Royal Commission on Vaccination concluded that vaccination in four places giving a total vaccination area of half of a square inch is more effectual and gives better protection against small-pox than is afforded by one place or a less vaccinated area.

Mr. PALING asked the Minister of Health whether, on Sept. 1st, the form of statutory declaration of objection to vaccination contained in the notice of the requirements of the Vaccination Acts given by the registrar when a birth was registered was to be dropped: and whether, under a new order to be issued on the above date, every parent wishing to get exemption for his child was to be compelled to go to the vaccination officer for the form.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative and to the second in the negative. The effect of the new order, which has already been issued, is that from and after Sept. 1st any parent wishing to make a statutory declaration of conscientious objection to vaccination may obtain a form of declaration from the vaccination officer, or may make a declaration in the form prescribed by the Vaccination Act, 1907, or in a form to the like effect.

Mr. BROAD asked the Minister of Health how many deaths from small-pox were registered from 1906 to 1920; how many chicken-pox deaths were registered in the same period; and whether in view of the statement of the Registrar-General in his report for the year 1889 that it was probable that most of the deaths registered as due to chicken-pox were in reality cases of modified small-pox, he would have the vaccinal condition of the deaths from chicken-pox stated on the death certificate, and also have such cases included in those of small-pox.—Mr. NEVILLE CHAMBERLAIN replied: The particulars asked for are as follows:—

England and Wales.

Year.	Deaths from—		Year.	Deaths from—	
	Small-pox.	Chicken-pox.		Small-pox.	Chicken-pox.
1906	21	106	1914	4	122
7	10	120	15	13	92
8	12	93	16	18	65
9	21	94	17	3	69
10	19	97	18	2	54
11	23	80	19	28	55
12	9	76	20	30	71
13	10	83			

The suggestions in the last part of the question will receive consideration.

Asylum Superintendent's Appointment.

Major MCKENZIE WOOD asked the Minister of Health whether he had received any protest from the medical profession in Lancashire with regard to the appointment of the superintendent of Prestwich Asylum, Manchester; and what action he proposed to take in the matter.—Mr. NEVILLE CHAMBERLAIN replied: The Board of Control have received no official information of the appointment of a medical superintendent at Prestwich Mental Hospital, but they understand that an appointment, to which strong exception is taken, was made last week by the Lancashire Asylums Board. The appointment rests with that body alone, but the Board of Control in January last suggested that it would be of advantage if they were consulted in regard to it. I do not know why this advice has not been acted upon, but the Board of Control propose to make some inquiry about the appointment.

Maternity and Child Welfare Centres.

Mr. TURNER asked the Minister of Health if his department were taking any special steps to develop maternity and child welfare clinics so as to cope with and help to reduce the death roll of ten per day occurring amongst women during pregnancy and childbirth.—Mr. NEVILLE CHAMBERLAIN replied: I am well aware of the continued high rate of maternal mortality associated with childbirth, and under the Maternity and Child Welfare Act I am endeavouring to encourage the establishment and development of maternity and midwifery services (including antenatal centres, maternity hospitals, and the provision of midwives). I hope that by such means the present death-rate will be progressively and substantially reduced.

Deaths of Women in Childbirth.

Mr. RHYS DAVIES asked the Minister of Health the percentage of deaths of women on confinement in this country for each of the last ten years and for periods of ten years prior; and how those figures compared with records in other countries.—Mr. NEVILLE CHAMBERLAIN replied: Figures for England and Wales in regard to deaths of women assigned to pregnancy or childbirth for the last ten years and for decennia from 1861 to 1910 are given in the following table together with such figures as are available in regard to other countries:—

Deaths of Women Assigned to Pregnancy or Childbirth.

A = Deaths per million living. B = Deaths per 1000 births.

—	England and Wales.*		Holland.†		Italy.		Japan.		Switzerland.		Sweden.	
	A	B	A	B	A	B	A	B	A	B	A	B
1861–70	341	4·70	—	—	—	—	—	—	—	—	—	—
1871–80	350	4·72	—	—	—	—	—	—	—	—	—	—
1881–90	318	4·73	—	—	—	—	—	—	—	—	—	—
1891–1900	301	5·09	—	—	—	—	—	—	—	—	—	—
1901–10	206	4·01	—	—	—	—	—	—	—	—	—	—
1913	185	3·96	—	—	—	—	—	—	—	—	53	2·28
1914	192	4·17	—	—	75	2·41	—	—	—	—	58	2·60
1915	176	4·18	—	—	—	—	120	—	—	—	63	2·90
1916	166	4·12	134	2·58	59	2·45	—	—	64	3·37	56	2·66
1917	132	3·89	131	2·53	56	2·86	120	3·59	44	2·42	51	2·46
1918	127	3·79	147	3·00	—	—	—	—	49	2·62	—	—
1919	154	4·37	161	3·35	—	—	—	—	60	3·19	—	—
1920	210	4·33	—	—	—	—	—	—	62	2·93	—	—
1921	168	3·91	—	—	—	—	—	—	—	—	—	—
1922	149	3·81	—	—	—	—	—	—	—	—	—	—

* Prior to 1911 puerperal nephritis and albuminuria were not classed to pregnancy and childbirth and consequently the rates shown from 1913 onwards are from ·22 to ·25 in excess of what they would have been under the old classification.

† The number of deaths per million living in Holland for 1911–15 (inclusive) was 126. The number of deaths per million living in Denmark in 1920 was 60 and the number per 1000 births was 2·35.

Tuberculosis in the Navy.

Lieut.-Colonel MOORE-BRABAZON asked the First Lord of the Admiralty the number of men, categoried in branches, who had been discharged from the Navy with tuberculosis in the last three years.—Major BOYD CARPENTER replied: No statistics have been prepared for 1920, and the figures for 1922 are not yet available. The following table gives the figures for 1921:—

Classes.	No. of cases.	Ratio per 1000 of average number borne.
Commissioned officers	10	1·77
Subordinate officers	—	—
Warrant officers	2	0·69
Seamen	103	2·46
Boys	14	1·69
Engine-room ratings	75	2·50
Marines	24	3·20
Stewards and cooks	5	1·33
Sick-berth staff	6	4·27
Regulating branch	—	—
Writers	8	8·77
Victualling ratings	3	4·49
Ships cooks	3	1·71
Armourers and blacksmiths	—	—
Other artisans	3	0·83
Kroomen, seedies, and lascars	—	—
Telegraphists	8	2·76
Miscellaneous ratings	—	—

Child's Death in Hospital.

Mr. GILBERT asked the Minister of Health whether his attention had been called to an inquest held on a child in one of the hospitals of the Metropolitan Asylums Board, at which charges were made by nurses against the doctor who attended the child: whether he proposed to hold any inquiry into the case; and could he make any statement on the subject.—Mr. NEVILLE CHAMBERLAIN replied: I have received a report upon this case from the Metropolitan Asylums Board, of which I will send the hon. Member a copy. It will be seen from the report that a full inquiry was held by the coroner, that the jury found that the death of the child was due to natural causes, and that the statements made by the nurses contained serious discrepancies. The nurses have been reprimanded for their failure to make an immediate report of the occurrences which they allege took place. Under all the circumstances I do not think that further inquiry on my part would serve any useful purpose.

Replying to a further question, Mr. CHAMBERLAIN said that he believed that the doctor had since resigned, but he could not state the reason for the resignation.

THURSDAY, AUGUST 2ND.

Highbury Pension Hospital Fire.

Mr. MACPHERSON asked the Minister of Pensions whether the committee which was appointed by him to enquire into the cause of the fire at Highbury Pensions Hospital and to make recommendations for the prevention of fire in the future at Ministry hospitals had yet reported, and if so, whether the report would be published.—Major TRYON replied: I have just received the report of this committee and I am arranging for it to be published.

Grant for Combating Venereal Disease.

Mr. ALBERT BENNETT asked the Prime Minister whether the Government would consider the allocation of the £12,000 annual grant for combating venereal disease between the Society for the Prevention of Venereal Disease and the National Council for Combating Venereal Disease; whether he was aware that the latter organisation was the only one in receipt of any State assistance; and why, seeing the Trevethin report had been unconditionally accepted by both, there was any differentiation made in respect to the Government assistance given.—Mr. NEVILLE CHAMBERLAIN replied: As regards the first part of the question, the maximum grant which will be paid from the Ministry direct to voluntary organisations in aid of their work in combating these diseases is £7500. The answer to the second part is in the affirmative. As regards the third part, the question of Government assistance to the work of voluntary organisations will come up for review in connexion with the recommendations in the Trevethin Report which is now under consideration.

Oxford and Cambridge Grants.

Mr. CHARLES BUXTON asked the Secretary to the Treasury whether he would take steps to obtain and publish annual returns from Oxford and Cambridge Universities in the same form as those now published in respect of other universities in Great Britain under the auspices of the University Grants Committee.—Sir W. JOYNSON-HICKS replied: I have requested the University Grants Committee to take such steps as appear practicable to obtain from the university authorities at Oxford and Cambridge returns which will be as nearly comparable as circumstances permit with those annually supplied to the Committee by other grant-aided university institutions and published in the Committee's Blue Book. The hon. Member will, however, appreciate that the conditions at Oxford and Cambridge differ in certain material respects from those which prevail at the other universities, and that as the records and accounts at the two ancient universities have not hitherto been kept with a view to returns on the lines which are required by the University Grants Committee, a little time may elapse before properly comparable figures for Oxford and Cambridge can be provided.

Medical News.

UNIVERSITY OF EDINBURGH.—At the graduation Ceremonial on July 20th the following degrees were conferred:—

DOCTOR OF MEDICINE.

Alfred F. Adamson, Robert A. Chambers (in absentia), Jacob D. M. Claassens, *James H. Clarke, William H. Dickinson, James F. Duncan, *Basil A. G. A. Edelston, †Joseph H. Fairweather, Thomas J. Howell, †Hugh A. Macmillan, ‡Robert Mailer (in absentia), †Gerald I. Moriarty, *James P. Watt, and ‡Harold W. Wilson.

* Commended for thesis. † Highly commended for thesis. ‡ Awarded gold medal for thesis.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

James N. Adam, Stuart F. Allison, David G. Anderson, David T. Anderson, Edward W. Anderson, Hope P. Anderson, David Band, John S. Banks, Charles Bateman, Elizabeth A. Baxendine, Ralph S. Begbie, Malcolm J. Bett, Alexander Beveridge, Helen Blacklay, Anna L. Blair, Charles E. M. Blumer, Harriette G. Bogle, Jane P. S. Bow, George P. F. Bowers, Margaret G. Bowie, Edwin F. Boyd, William Boyd, Robert D. Bradshaw, Donald Brims, Norman M'Dowell Brown, William N. Brown, William J. Burns, Thomas D. Burt, Andrew J. M. Butter, Eva T. Cairns, Flora H. M. Calder, Dugald Cameron, James D. S. Cameron, Angus Campbell, Lovat F. Capell, †Robert Carmichael, Harold Carter, William H. Carter, Aileen M. Chester, Dorothy A. Christie, Alec L. Clark, Antonio G. Coia, Harry H. Condie, John Cooper, Andrew Cowan, John M. Cowan, Marget A. Craig, James Crooks, James F. Cunningham, James D. Dear, Robert Dick, Alexander Dickson, William R. Duff, Gavin A. Dunlop, Henry H. Dunlop, Charles W. Durward, *Caroline A. Elliott, Helen B. Ewart, Marjory H. Ewing, William R. D. Fairbairn, John S. Faulds, Alan W. Fawcett, Andrew W. Gardiner, Elizabeth M. R. Garrigan, Frederick W. Gavin, John Gillies, Malcolm A. Graham-Yooll, Robert Grant, *John Gray, Alexander M. M. Grierson, David Grieve, Ian M. D. Grieve, Basil T. Halliwell, Ronald W. W. Hardie, George M'Neill Hargreaves, Clement Henri de la Harpe, James A. Harris, Edith N. Hartley, William M. Hetherington, Stephen L. Hislop, Paget C. C. B. Hook, Doris M. Hopps, George Horne, Agnes M. M. Hunter, Edith I. M. Irvine-Jones, Agnes L. Jenkins, Clifford D. Kennedy, Alexander M. Kerr, Henry J. R. Kirkpatrick, Pieter Louis Kock, Ena M'Laren Laing, John Lambert, William T. Lawson, Tiang Keng Lee, Reuben Levinson, Nora Lister, Elspeth H. R. Livingstone, William Love, Edward B. Low, Phyllis M. H. Lunn, George A. Macadie, Donald I. Macaulay, Archibald R. MacCallum, Alexander R. M'Clure, Adam D. Macdonald, John A. Macdonald, Andrew M'Dowall, William S. M'Ewan, Robert M. Macfarlane, John S. MacGill, Isaac H. Maciver, Francis B. MacKenzie, Alexander MacPherson, John B. C. Madge, William F. Mair, Desmond S. Malone, Ahmed Marly, John J. B. Martin, George A. Masson, Reginald J. Matthews, Margaret G. Maxwell, *Alison J. Maxwell-Wood, Henry Miller, Ellen A. Morrison, George H. Morrison, William Morrison, Janet M. Morton, Ralph Morton, Hugh Munro, Harold B. Newcombe, Agnes M. Ogilvie, Denis C. Osborne, Llewelyn C. Palmer-Jones, *James R. K. Paterson, Susanne J. Paterson (in absentia), Kate Y. Pearson, Archibald Penman, George H. Percival, Oswald O. Popper, Frederic N. R. Price, Jean R. Purves, Adam L. K. Rankin, John Reid, Robert J. Reid, James S. Riddle, Frank L. Rifkill, Richard P. A. Rigg, Hilda C. Roberts, Ian M. Robertson, Gilbert M. Ross, Alexander A. M. Sandison, Pincus Schneiderman, William C. S. B. Sewrey, Donald A. M. Shearer, Bertram Siddons, William A. Simpson, James Sinclair, Cecil Siung (in absentia), James M'Ildowie Smellie, Arthur B. Smith, Arthur F. Smith, Dorothy F. Smith, Jean L. Smith, Sydney M'Kendrick Smith, George Somerville, Robert C. Speirs, Alice Steven, Donald B. Strachan, *John Sturrock, Theodotus J. Sumner, Hector W. Sutherland, Charles J. Swanson, Richard E. M. Taunton, Leslie M. Thompson, Vera Thompson, Elsie Thomson, Frank B. Thomson, George H. Thomson, Kenmure J. Thomson, Mahmoud S. Toukhy, John Trotter, Thomas Tully, Anne M. Turnbull, Duncan A. Urquhart, Edward R. C. Walker, Forbes M'Donald Walker, Edgar P. Waters, William N. B. Watson, George M. Westwood, *Adam Cairns White, Illtyd G. Williams, John H. Williams, Norman B. Williamson, Charles R. Wilson, Jeanie Wilson, Mary Wilson, *William Muirhead Wilson, John F. S. Wiseman, Gerald K. Wood, Eric D. M. Wright, David H. D. Young, James B. Young, and James N. Young.

† First-class honours. * Second-class honours.

DIPLOMA IN PUBLIC HEALTH.

Esther J. Campbell, Mary C. Campbell, Grace Cumming, Gladys H. Dodds, Thomas Ferguson, Elspeth L. Gilmour, Elizabeth R. Kemp, Catherine A. J. Mitchell, Dorothea M. Norwell, Annie C. Roberts, Jessie W. Strang, Isabella Taylor, Annie E. Webster, and Doris S. Williams.

The following awards were also made: Thesis Gold Medallists: Robert Mailer and Harold W. Wilson. Cameron Prize in Practical Therapeutics: John J. R. Macleod. Gunning Victoria Jubilee Prize in Materia Medica: John H. Crawford. Gunning Victoria Jubilee Prize in Forensic Medicine: Douglas J. A. Kerr. Gunning Victoria Jubilee Prize in Obstetrics: Douglas A. Miller. Ettles Scholarship and Leslie Gold Medal: Robert Carmichael. Allan Fellowship in Clinical Medicine and Clinical Surgery: John Gray. Murchison Memorial Scholarship in Clinical Medicine: John Gray. M'Cosh Graduate's and Medical Bursaries: William N. B. Watson. Beaney Prize in Anatomy and Surgery: Caroline A. Elliott. Mouat Scholarship in the Practice of Physic: James L. N. Dinwiddie. Conan Doyle Prize: Gabriel G. King. Annandale Gold Medal in Clinical Surgery: John M. Cowan. Buchanan Scholarship in Gynæcology: Ian M. Robertson. James Scott Scholarship in Midwifery: Frank B. Thomson. Scottish Association for Medical Education of Women Prize: Caroline A. Elliott. Dorothy Gilfillan Memorial Prize: Harriette G. Bogle. Wellcome Medals in the History of Medicine: Gold Medal, James Aitken; Silver Medal, Donald G. S. M'Lachlan. Wightman Prize in Clinical Medicine: William J. A. Coldstream. Cunningham Memorial Medal and Prize in Anatomy: George Brown. Whiteside Bruce Bursary: Ian G. W. Hill.

PRUDENTIAL ASSURANCE COMPANY AND MEDICAL RESEARCH.—The board of management of the Hospital for Sick Children, Great Ormond-street, London, whose Chairman is the Earl of Wemyss, have decided to establish a Research Department in which highly trained experts may study the life histories, conditions of growth, &c., of living agents of children's diseases. Examination revealed the fact that some £2000 would be required each year for the working of the Research Department; the board appealed for financial help to the Directors of the Prudential Assurance Company, on the ground that the proposed research work would promote longevity and the development of a healthier and more virile race. As a result, the Directors of the "Prudential" consented to provide the money required for the first year.

LONDON HOSPITAL.—The old students' dinner of the London Hospital will be held at the Trocadero Restaurant on Wednesday, Oct. 3rd, at 7.30 for 8 P.M.

THE Schorstein Memorial Lecture in Clinical Medicine will be delivered by Dr. Gordon Holmes in the Medical College of the London Hospital during the winter term.

LONDON HOSPITAL MEDICAL COLLEGE.—A lecture on the Value of Accurate Small-pox Diagnosis will be delivered in the Anatomical Theatre of the College by Dr. W. McConnel Wanklyn, principal assistant medical officer of health, London County Council, on August 15th.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.—Entrance Scholarships for the year 1923 have been awarded as under: Entrance Arts Scholarship (value £50): Mr. D. H. Le Good (Alleyn's School). Entrance Science Scholarships: (1) Mr. H. C. Trowell (Reigate Grammar School) value £150; (2) Mr. I. J. Jones (St. Thomas's Medical School) value £60. William Tite Scholarship (value £25): Mr. J. B. George.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A special course of post-graduate lectures in infants' diseases, for medical officers of welfare centres and others, will be given at the Infants' Hospital, Vincent-square, Westminster, London, S.W., from Sept. 3rd to 21st. The fee for the course is £5 5s., and the names of those wishing to attend should be sent at once to the Secretary of the Fellowship, 1, Wimpole-street, W. 1. The dates of the lectures will be announced in our Medical Diary.

WALSALL M.O.H.: A COMPROMISE REACHED.—Some time ago the Walsall Town Council offered a salary of £800 per annum as the salary for the borough medical officer. The British Medical Association stipulated that the amount should be £1100, and a dispute thereupon arose, with the result that there was not a single application for the appointment. On August 4th a compromise was reached, and Dr. J. A. Clark, borough tuberculosis officer, was appointed at a salary of £900.

Dr. Michael J. Nolan, resident medical superintendent, Down District Asylum, Downpatrick, Co. Down, has been elected President of the Medico-Psychological Society of Great Britain and Ireland. Dr. Nolan is probably the only man to hold office under both the Irish Free State and the Government of Northern Ireland, being consulting visitor in lunacy to the Lord Chief Justice of either country.

ROYAL NORTHERN HOSPITAL.—The hospital board of management announce that the £20,000 which was needed by July 31st to prevent the closing of wards in the four institutions under their control has not been obtained. Consequently they have had no alternative but to close 70 beds. Although the appeal was widespread, only £1500 have been received towards this fund. This closing of 70 beds means that over a period of a year another thousand cases will have to be refused admission for treatment.

DONATIONS AND BEQUESTS.—The late Mr. Hugh Fullerton, of Brackenhoe, Sale, Cheshire, has left £5000 to the Christie Hospital Cancer Pavilion (if not already given), for assisting in carrying on scientific investigation in relation to cancer; £500 each to the Whitehaven and West Cumberland Infirmary and the Manchester Royal Infirmary; and £100 each to the National Lifeboat Institution, the Royal Eye Hospital, the Northern Hospital for Women and Children, Henshaw's Blind Asylum, the Deaf and Dumb Institution, the Royal Schools for the Deaf and Dumb, Ancoats Hospital and Ardwick and Ancoats Dispensary, and the Hospital for Consumption, Hardman-street, Manchester.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN.—The following scholarships have been awarded for the session 1923-1924: Fishmongers' Exhibition for Girls (£50 a year for 3 years): Miss Winifred Harris (L.S.M.W.). Bostock Scholarship (£20 for 4 years): Miss Alice Hodge (L.S.M.W.). St. Dunstan's Medical Exhibition (£60 for 3 or 5 years): Miss Joyce Woods (City of London Girls' School). Mrs. George M. Smith Scholarship (£50 a year for 5 years): Miss Kathleen Gambrell (Streatham Secondary School). Dr. Margaret Todd Scholarship (£37 10s. for 4 years): Miss Dorothy Wilkins, B.Sc. (Bedford College for Women). Mabel Sharman Crawford Scholarship (£20 for 4 years): Miss Marguerite Fenn (L.S.M.W.). Sarah Holborn Scholarship (£20 for 5 years): Miss Ivy Varley (Newland High School, Hull). Isabel Thorne Scholarship (£30): Miss Dorena Tracey (Hamilton House, Tunbridge Wells). Dr. Edith Pechey Phipson Post-Graduate Scholarship (£160 a year for 1, 2, or 3 years): Dr. G. M. R. Webster.

PUBLIC HEALTH LEGISLATION IN THE IRISH FREE STATE.—On August 1st a deputation from the Irish Medical Committee waited on the Minister of Local Government (Mr. E. Blythe) to make certain representations to the Minister with regard to the Public Health Bill which, it is announced, will be brought forward in the Dail at an early date. The deputation urged the acceptance of the entire programme of the Irish Public Health Council, including the establishment of a Ministry of Health and of a National Medical Service, and discussed questions relating to the Poor-law Medical Service (inadequate salaries, arrangements for holidays, and fees for occasional services).

MEDICAL CHARITABLE SOCIETY FOR THE WEST RIDING OF YORKSHIRE.—This society, founded in 1828, is one of the most flourishing of the societies connected with the medical profession. The annual subscription is one guinea, and those eligible for membership are medical men who at the period of their becoming members have not passed the age of 40, and have not been in practice in the West Riding more than 15 years without subscribing. From time to time the society has given in grants a sum amounting very nearly to £80,000; its investments have a nominal value of £43,374. The year from July 1st, 1922, to June 30th, 1923, began with a membership of 879. This number fell during the year to 853 in consequence of deaths and resignations, but was brought up to 897 by the election of new members, and the society now has a larger membership than ever before. Since the year 1911 the society has been administered under a trust deed. The work done by Dr. J. E. Eddison, who of late years has devoted much of his leisure to the work of the charity, is gratefully borne in mind by those connected with the society. No payment whatever is made to anyone connected with the work of the society, except to the professional auditors. Every request for assistance is closely scrutinised and sympathetically dealt with, and it is confidently claimed that no deserving case is ever passed over.

Appointments.

MARCUS, MAURICE, M.B., B.S. Lond., M.R.C.S., has been appointed Hon. Anæsthetist London Jewish Hospital.

SANDILAND, E. L., M.B., B.S. Lond., D.P.H., M.R.C.S., L.R.C.P. Lond., Medical Superintendent of East Lancs Tuberculosis Colony, Cheshire.

SCHUSTER, NORAH, M.B., Ch.B., Pathologist to the Infants Hospital, Vincent-square, Westminster.

Manchester Royal Infirmary: STAFFORD, H., M.B., Ch.B. Manch., Assistant Director of the Clinical Laboratory: SMITH, ELEANOR P., M.B., Ch.B. Manch., Assistant Resident Medical Officer Central Branch.

St. Thomas's Hospital: DYSON, A. D., M.R.C.S., L.R.C.P. Lond.; MURRELL, E. B., M.R.C.S., L.R.C.P. Lond.; COOPER, G. K., M.B., B.Ch. Camb.; PALMER, H. M., M.R.C.S., L.R.C.P. Lond.; LAUTRE, M. A., M.R.C.S., L.R.C.P. Lond; LUPTON, C. A., M.R.C.S., L.R.C.P. Lond.; BRIGGS, T. F., M.R.C.S., L.R.C.P. Lond.; WILLIAMS, L. G., M.R.C.S., L.R.C.P. Lond., Casualty Officers and Resident Anæsthetists. STORY, A. G., M.R.C.S., L.R.C.P. Lond.; COLE, L. B., M.B., B.Ch. Camb.; GIBSON, C. P. R., M.R.C.S., L.R.C.P. Lond.; FULLER, C. B. S., M.B., B.Ch. Camb., Resident House Physicians. LUND, G. S., M.R.C.S., L.R.C.P. Lond., Resident House Physician for Children. SUDBURY, F. B., M.R.C.S., L.R.C.P. Lond.; DAVIES, D. A., M.R.C.S., L.R.C.P. Lond.; HUGHES, K. E. A., M.R.C.S., L.R.C.P. Lond.; CROCKFORD, A. L., M.B., B.Ch. Camb., Resident House Surgeons. WILKINSON, M. C., M.R.C.S., L.R.C.P. Lond., Resident Orthopædic House Surgeon. KIES, J. P., M.R.C.S., L.R.C.P. Lond.; WALFORD, A. S. H., M.B., B.Ch. Camb., Resident House Surgeons for Ear, Nose, and Throat. BERRIDGE, W. C. M., M.R.C.S., L.R.C.P. Lond., Senior Obstetric House Physician; MORRISON, R. G., M.R.C.S., L.R.C.P. Lond., Junior Obstetric House Physician. DOGGART, J. H., M.R.C.S., L.R.C.P. Lond., Senior Ophthalmic House Surgeon; NICORY, C., M.R.C.S., L.R.C.P. Lond., Junior Ophthalmic House Surgeon. A. F. POTTER, M.R.C.S., L.R.C.P. Lond., R.M.O. St. Thomas's Home. HILL, H. G., M.B. Camb., Senior Medical Casualty Officer. PATRICK, C. V., M.R.C.S., L.R.C.P. Lond., Senior Surgical Casualty Officer. CARDELL, J. D. M., M.B., B.S. Lond., Senior Resident Anæsthetist. CAVENAGH, J. B., M.B., B.Ch. Oxf.; NEILSON, D. F. A., F.R.C.S. Eng.; JONES, B. H., M.R.C.S., L.R.C.P. Lond.; FACEY, R. V., M.R.C.S., L.R.C.P. Lond.; LOCKHART, L. P., M.R.C.S., L.R.C.P. Lond.; MARRINER, H. L., F.R.C.S. Edin.; HICKS, E. W., L.M.S.S.A.; PENMAN, G. G., M.R.C.S., L.R.C.P. Lond.; FRANKLIN, C. A. H., M.R.C.S., L.R.C.P. Lond.; CREED, R. S., M.R.C.S., L.R.C.P. Lond.; CURWEN, E. C., M.R.C.S., L.R.C.P. Lond.; STEVENS, A. L. B., M.B., Ch.B. Oxf.; MOWLE, A. C., M.R.C.S., L.R.C.P. Lond.; WALKER, E. G. L., M.R.C.S., L.R.C.P. Lond.; ALLAN, F. G., M.R.C.S., L.R.C.P. Lond.; JARRATT, W. O. C., M.R.C.S., L.R.C.P. Lond.; ALDEN, J. W., M.R.C.S., L.R.C.P. Lond.; A. L. P. JEFFERY, M.R.C.S., L.R.C.P. Lond., Clinical Assistants.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal Mineral Water Hospital.—Res. M.O. £200.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each £100.

Birkenhead Borough Hospital.—Hon. Skin Specialist.

Birmingham, City Hospital, Little Bromwich.—Senior Asst. M.O. £350.

Birmingham General Dispensary.—Res. M.O. £450.

Birmingham, West Heath Sanatorium, &c.—Med. Supt. £650.

Blackburn County Borough.—Asst. M.O.H. £736.

Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £120.

Cape Town University.—Wernher Beit Professor of Bacteriology.

Carlisle, Cumberland Infirmary.—Res. M.O. £175.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75.

Chester City and County.—Asst. M.O.H. £500.

Croydon County Borough.—Deputy M.O.H. and School M.O. £780.

East African Medical Service.—M.O. £600.

Exminster, Devon Mental Hospital.—Third Asst. M.O. £300.

Federated Malay States, Central Mental Hospital.—Asst. Med. Supt. £616.

Hull Tuberculosis Sanatorium, Cottingham.—Res. Tub. O. £350.

Leeds University, Dept. of Physiology.—Prof. of Phys. Also Lecturer in Phys. £800 and £600 respectively.

Lenham Sanatorium.—Med. Supt. £650.

Liverpool, Royal Southern Hospital.—Two H.P.'s. and Three H.S.'s. Each £100. Also Res. Cas. O. £150.

London Temperance Hospital, Hampstead-road, N.W.—H.P. £120.

Manchester, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £250.

Manchester, St. Mary's Hospitals for Women and Children.—Two H.S.'s. Each £50.

Rotherham Hospital.—Sen. H.S. £260.

Royal Naval Medical Service.—Surgeon Lieutenants.

Staffordshire Education Committee.—Two Asst. School Med. Inspectors. £600.

Sutton, Surrey, Downs Hospital for Children.—Asst. M.O. £515.

Warwickshire, King Edward VII. Memorial Sanatorium, Hertford Hill, near Warwick.—Asst. Res. M.O. £350.

West African Medical Service.—M.O. £660.

West Riding County Council.—School Med. Inspector. £500.

The Secretary of State for the Home Department gives notice of vacancies for Medical Referees under the Workmen's Compensation Act, 1906, for County Court Circuit Nos. 6, and 42 and 50 (St. Helens, &c., County Courts). Applications should reach the Private Secretary, Home Office, not later than August 25th.

Births, Marriages, and Deaths.

BIRTHS.

LIVINGSTON.—On August 2nd, at Wigmore-street, the wife of Flight-Lieut. P. C. Livingston, R.A.F. Medical Service, of a son (Clermont).

MARSHALL.—On August 3rd, at the Manor House, Goudhurst, Kent, the wife of R. Prynne Marshall, M.R.C.S., L.R.C.P., of a son.

PARKINSON.—On August 3rd, at 1, Devonshire-place, W. 1, the wife of John Parkinson, M.D., F.R.C.P., of a daughter.

MARRIAGES.

MARKLOVE—DAVIES.—On August 2nd, at the Parish Church, Stroud, John Carrington Marklove, M.R.C.S., L.R.C.P., to Muriel Alice Mary Davies, M.R.C.S., L.R.C.P., elder daughter of Mr. and Mrs. A. Barnes Davies, of The Old Vicarage, Stroud.

UNDERHILL—WORNUM.—On August 2nd, at All Souls' Church, Hampstead, Sydney William Frank Underhill, M.A., B.M., B.Ch., to Edith Betty, youngest daughter of the late G. Porter Wornum, Esq., L.R.C.P., M.R.C.S., and Mrs. Wornum, of Belsize-park, Hampstead.

DEATHS.

SMITH.—On August 5th, at 12, Clarence-road, Gorleston-on-Sea, Oliver Smith, M.B., Ch.B. Edin., aged 41 years.

STEWART.—On July 30th, suddenly, at his residence, Devonshire-road, Birkenhead, Andrew Stewart, L.R.C.P., L.R.C.S., in his 69th year.

WILKINSON.—On July 28th, at Portland-place, Leamington Spa, suddenly, Lancelot Craven Wilkinson, M.R.C.S., L.R.C.P., F.R.G.S., aged 43 years.

WILLIAMS.—On August 1st, at the County Hospital, Huntingdon, Frederick Edgar Williams, M.R.C.S., L.R.C.P., B.A. Camb., in his 61st year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

SCHOLARSHIP IN MEDICINE.

BY SIR HENRY MORRIS, BART., M.A., M.B. LOND.

IN a letter to the *Times* on June 11th last, Mr. Gillbard alluded to the scientific, technical, and materialistic trend of medical education in the present day, and said that on that account a liberal and classical preliminary education for medical students is more than ever necessary. He told how Harvey, when in attendance on Charles the First at Edgehill, was found behind a hedge in the danger zone reading Virgil; and he grouped together Harvey, Sydenham, and Hunter as typical believers in the humanities. Two days later, Mr. George C. Peachey, in a letter also in the *Times*, (June 13th), took exception to the inclusion with Harvey of both Sydenham and "John" Hunter, as examples of the effect of classical education upon the progress of medical science—a selection which, he thinks, singularly unhappy.

In regard to Sydenham, who published a number of his works in the Latin language, there has been a considerable amount of discussion as to whether he wrote them originally in Latin or in English and got them translated into Latin. In regard to Hunter, Mr. Gillbard, in mentioning him, did not say "John" Hunter, who, it is true, had no classical education at all, and little general education of any kind. The Hunter to whom Mr. Gillbard referred, was, no doubt, John Hunter's brother, Dr. William Hunter, a man of great culture and learning, whose fine library of Greek and Latin classics, and whose extensive collections of natural history and other specimens passed to, and are now the property of, the University of Glasgow.

Francis Adams, M.R.C.S. Eng.

But the chief interest of Mr. Peachey's letter lies in his revival of the memory of a certain country surgeon, who lived and died a general practitioner in a small village on Deeside, and whose name is now almost forgotten, though it is but 62 years since his death. The name is that of Dr. Francis Adams, M.R.C.S. Eng., M.A. Aberdeen, and LL.D. Glasgow, of Banchory-Ternan, the editor and translator of Hippocrates, Paulus Ægineta, and Aretæus. Mr. Peachey spoke of Dr. Adams as "probably the greatest classical scholar among British medical practitioners of all time," and quoted some anonymous person who, in 1857, described him as "the most learned physician in Britain and probably in Europe."

Beyond question Dr. Adams was a great scholar, who possessed a most accurate and extensive acquaintance with the language and literature of Greece, and he ought to be remembered with special pride, and for all time, by those who practise medicine, as one whose classical attainments and competent knowledge of the French and German languages caused him to stand out prominently during life as a scholar, and enabled him to leave behind him writings which should make his name for ever famous. His translation of the "genuine" Hippocratic treatises is the only complete one in the English language; the same is true of his translation of the seven books of Paulus Ægineta, and of the treatise of diseases by Aretæus, the Cappadocian, one of the most celebrated of the ancient Greek physicians, and who is noticeable because of his dissension from the teaching of Hippocrates when he thought it imperfect or incorrect. By these translations, Adams did as great a service to those members of the medical profession who are not great Greek scholars, as Jacques Amyot (1513–93) did for the general run of French readers by his numerous translations of Greek literature and, especially, by his translation of Plutarch's "Lives" from the Greek into French; and as an English translation of the "Lives" was afterwards made from the French edition, Amyot's dissemination of Greek literature had its effect upon English prose, as well as upon French.

Adams should have a Memorial in the Royal College of Surgeons.

But Adams's claim to distinction is not merely that of a translator of concise and often obscurely expressed Greek treatises, such as those of Hippocrates, but because of the care with which he examined for himself the passages in ancient authors bearing on points open to discussion, and of his erudite "*preliminary discourse*" on the Hippocratic treatises, and the innumerable annotations and references throughout that work. He is said to have made himself acquainted with every extant Greek writing, not Greek medical writings only; and there is ample proof throughout this translation of Hippocrates, of his wide knowledge of Oriental, English, and European commentators and historians who have discussed the works of Hippocrates.

The period at which Hippocrates was practising his profession was "one of the most memorable epochs in the intellectual development of the human race," and Adams shows a familiarity also with the lives of all the great statesmen, artists, and scholars of that time. Indeed, Adams's erudition was so remarkable, and was developed so largely amidst the interruptions and distractions of medical practice, that there ought to be a bust or some other form of memorial of him in the Royal College of Surgeons of England, to mark the honour he is to his College, and to record the extraordinary degree of literary culture to which he attained whilst discharging to the full the duties of a general medical practitioner.

But notwithstanding the truth of the above appreciation of Adams's erudition, some consideration of others ought to be shown before accepting off hand the title accorded to Adams by the *Medical Times and Gazette* (1861) of "Doctissimus Britannorum," and more especially before we claim for him the position of the most learned physician in Europe.

Linacre and Rabelais.

In this connexion something requires to be said about Linacre for England, and Rabelais for France. Linacre (1460–1524) lived at a critical period in the history of learning, when the world was entering on a crisis, passing from the mediævalism of the schoolmen to the wider culture of the "New Learning." Rabelais (1495–1535) came somewhat later, but was one of the most notable writers and thinkers of the early days of the French Renaissance. Linacre had received an incentive to the study of Greek at the Cathedral School at Canterbury, and, after election to a Fellowship at All Souls' College, Oxford, he, with Colet (1467–1519) and a few other Oxford scholars visited Italy, in 1493, and there became imbued with the learning and spirit of the Italian Renaissance. England was a long way behind France and still further behind Italy in exorcising the old conditions of mediævalism and introducing the humanities of the Renaissance; but in Paris, on their way back to Oxford, Linacre and Colet came into touch with the two men who were supreme in their influence upon European scholarship in the latter part of the fifteenth century and the first half of the sixteenth century. These two men were Guillaume Budé (Budæus) and Erasmus, who were exact contemporaries of one another, having been born in 1466–67.

France had now gone ahead of Italy and become the centre of European Greek culture and literature; and foremost in France was Budæus, a Frenchman and a teacher of Greek in the University of Paris, who became the most famous man in Europe as an author on Greek philology, Roman law, and on education generally. Erasmus, the Dutchman, whose scholarly genius was developed in France, was the only rival of Budæus, but was not his equal in Greek, though superior to him in style in the writing of Latin. Linacre and Colet formed ties of close friendship with these two men, upon whom in turn they exercised a marked influence; and on their own part, by their eager study of Greek, they not only illuminated the darkness which prevailed in England in the period preceding the English Renaissance, and took the lead in the revival of classical literature and the humanistic movement in England in the Tudor period, but made some impression on contemporary European culture, in which Linacre and Sir Thomas More, especially, played distinguished parts.

Budé's influence on Colet was great and, under the zeal for educational reform which he had imbibed from him, Colet founded, or re-founded and enlarged St. Paul's School in London for the study of Greek, as well as Latin.

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No other classical scholar in British medicine has ever exercised so deep and wide an influence on classical literature and humanistic culture, outside his own country, as did Linacre. In spite of the efforts of Linacre and Colet, however, Renaissance teaching was not to any great degree accepted by the English. This was shown by the coldness and indifference which More's "Utopia" met with in England and the welcome given to its appearance on the Continent.

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A very notable feature of More's "Utopia" was the deep interest it aroused in Rabelais and the familiarity with its contents which is shown by Rabelais in his celebrated work, "Gargantua and his giant son, Pantagruel." Rabelais was greatly indebted to More. It would not be in place here to describe the similarity between Rabelais's story and More's political and social romance; but it is worthy of mention when passing on to consider Rabelais's reputation as a physician. I have on a previous occasion, in the columns of THE LANCET (1910, vol. i., p. 1155), written of this side of Rabelais's life, and if I again allude to it now, it is to speak of his scholarship in relation to his comparative eminence in medicine. Until the end of the fifteenth century, Greek was not known in France, but in 1495, the year of Rabelais's birth, a small coterie of scholars, including two physicians, was formed in Paris for the express study of Greek. Rabelais had previously studied Greek under difficulties, but when 25 years of age he got into communication with several members of this coterie, and with Erasmus, the leading scholar in Europe. One consequence of his acquiring Greek was that when lecturing in Montpellier, Rabelais was able to base his lectures on the Greek original of Galen, and on his own copy of the ancient manuscript of Hippocrates, instead of upon the mutilated and imperfect Latin translations used by former professors.

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FEMININE PSYCHOLOGY.

A WORK demanding that woman, unfitted for anything else by her manifold vices and imperfections, must have her powers curtailed and be restricted to the exercise of her reproductive functions, is something of an anachronism. That her vices result from a biological need is Mr. Ludovici's[1] vindication of her, and the vices are fully and feelingly described. The author writes in the style of the author of "Lovely Woman," but, unlike Mr. Crosland, takes himself seriously; so seriously, indeed, that he regresses to that primitive phantasy which psychologists call "the omnipotence of thought." What he thinks ought to be, is. Fertilisation is a natural process in woman; its absence leads to physiological disappointment, which "sings in chorus with the psychical disillusionment"; then she seeks a co-respondent: hence follows the frequency of divorce. The author thinks this ought to happen, so it happens. The control of conception ought to be harmful, so in the man "ultimate anæsthesia is inevitable." The thesis requires that woman should be unfit for sports; unfit she is, especially during her "moments of indisposition," and her violent sports, by a round-about pathology, lead to "very obscure but severe

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[1] Woman: A Vindication. By Anthony M. Ludovici. London: Constable. 1923. Pp. 375. 12s.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal Mineral Water Hospital.—Res. M.O. £200.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each £100.
Birkenhead Borough Hospital.—Hon. Skin Specialist.
Birmingham, City Hospital, Little Bromwich.—Senior Asst. M.O. £350.
Birmingham General Dispensary.—Res. M.O. £450.
Birmingham, West Heath Sanatorium, &c.—Med. Supt. £650.
Blackburn County Borough.—Asst. M.O.H. £736.
Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £120.
Cape Town University.—Wernher Beit Professor of Bacteriology.
Carlisle, Cumberland Infirmary.—Res. M.O. £175.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75.
Chester City and County.—Asst. M.O.H. £500.
Croydon County Borough.—Deputy M.O.H. and School M.O. £780.
East African Medical Service.—M.O. £600.
Exminster, Devon Mental Hospital.—Third Asst. M.O. £300.
Federated Malay States, Central Mental Hospital.—Asst. Med. Supt. £616.
Hull Tuberculosis Sanatorium, Cottingham.—Res. Tub. O. £350.
Leeds University, Dept. of Physiology.—Prof. of Phys. Also Lecturer in Phys. £800 and £600 respectively.
Lenham Sanatorium.—Med. Supt. £650.
Liverpool, Royal Southern Hospital.—Two H.P.'s. and Three H.S.'s. Each £100. Also Res. Cas. O. £150.
London Temperance Hospital, Hampstead-road, N.W.—H.P. £120.
Manchester, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £250.
Manchester, St. Mary's Hospitals for Women and Children.—Two H.S.'s. Each £50.
Rotherham Hospital.—Sen. H.S. £260.
Royal Naval Medical Service.—Surgeon Lieutenants.
Staffordshire Education Committee.—Two Asst. School Med. Inspectors. £600.
Sutton, Surrey, Downs Hospital for Children.—Asst. M.O. £515.
Warwickshire, King Edward VII. Memorial Sanatorium, Hertford Hill, near Warwick.—Asst. Res. M.O. £350.
West African Medical Service.—M.O. £660.
West Riding County Council.—*School Med. Inspector. £500.*

The Secretary of State for the Home Department gives notice of vacancies for Medical Referees under the Workmen's Compensation Act, 1906, for County Court Circuit Nos. 6, and 42 and 50 (St. Helens, &c., County Courts). Applications should reach the Private Secretary, Home Office, not later than August 25th.

Births, Marriages, and Deaths.

BIRTHS.

LIVINGSTON.—On August 2nd, at Wigmore-street, the wife of Flight-Lieut. P. C. Livingston, R.A.F. Medical Service, of a son (Clermont).

MARSHALL.—On August 3rd, at the Manor House, Goudhurst, Kent, the wife of R. Prynne Marshall, M.R.C.S., L.R.C.P., of a son.

PARKINSON.—On August 3rd, at 1, Devonshire-place, W. 1, the wife of John Parkinson, M.D., F.R.C.P., of a daughter.

MARRIAGES.

MARKLOVE—DAVIES.—On August 2nd, at the Parish Church, Stroud, John Carrington Marklove, M.R.C.S., L.R.C.P., to Muriel Alice Mary Davies, M.R.C.S., L.R.C.P., elder daughter of Mr. and Mrs. A. Barnes Davies, of The Old Vicarage, Stroud.

UNDERHILL—WORNUM.—On August 2nd, at All Souls' Church, Hampstead, Sydney William Frank Underhill, M.A., B.M., B.Ch., to Edith Betty, youngest daughter of the late G. Porter Wornum, Esq., L.R.C.P., M.R.C.S., and Mrs. Wornum, of Belsize-park, Hampstead.

DEATHS.

SMITH.—On August 5th, at 12, Clarence-road, Gorleston-on-Sea, Oliver Smith, M.B., Ch.B. Edin., aged 41 years.

STEWART.—On July 30th, suddenly, at his residence, Devonshire-road, Birkenhead, Andrew Stewart, L.R.C.P., L.R.C.S., in his 69th year.

WILKINSON.—On July 28th, at Portland-place, Leamington Spa, suddenly, Lancelot Craven Wilkinson, M.R.C.S., L.R.C.P., F.R.G.S., aged 43 years.

WILLIAMS.—On August 1st, at the County Hospital, Huntingdon, Frederick Edgar Williams, M.R.C.S., L.R.C.P., B.A. Camb., in his 61st year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

SCHOLARSHIP IN MEDICINE.

BY SIR HENRY MORRIS, BART., M.A., M.B. LOND.

IN a letter to the *Times* on June 11th last, Mr. Gillbard alluded to the scientific, technical, and materialistic trend of medical education in the present day, and said that on that account a liberal and classical preliminary education for medical students is more than ever necessary. He told how Harvey, when in attendance on Charles the First at Edgehill, was found behind a hedge in the danger zone reading Virgil; and he grouped together Harvey, Sydenham, and Hunter as typical believers in the humanities. Two days later, Mr. George C. Peachey, in a letter also in the *Times*, (June 13th), took exception to the inclusion with Harvey of both Sydenham and "John" Hunter, as examples of the effect of classical education upon the progress of medical science—a selection which, he thinks, singularly unhappy.

In regard to Sydenham, who published a number of his works in the Latin language, there has been a considerable amount of discussion as to whether he wrote them originally in Latin or in English and got them translated into Latin. In regard to Hunter, Mr. Gillbard, in mentioning him, did not say "John" Hunter, who, it is true, had no classical education at all, and little general education of any kind. The Hunter to whom Mr. Gillbard referred, was, no doubt, John Hunter's brother, Dr. William Hunter, a man of great culture and learning, whose fine library of Greek and Latin classics, and whose extensive collections of natural history and other specimens passed to, and are now the property of, the University of Glasgow.

Francis Adams, M.R.C.S. Eng.

But the chief interest of Mr. Peachey's letter lies in his revival of the memory of a certain country surgeon, who lived and died a general practitioner in a small village on Deeside, and whose name is now almost forgotten, though it is but 62 years since his death. The name is that of Dr. Francis Adams, M.R.C.S. Eng., M.A. Aberdeen, and LL.D. Glasgow, of Banchory-Ternan, the editor and translator of Hippocrates, Paulus Ægineta, and Aretæus. Mr. Peachey spoke of Dr. Adams as "*probably the greatest classical scholar among British medical practitioners of all time*," and quoted some anonymous person who, in 1857, described him as "*the most learned physician in Britain and probably in Europe.*"

Beyond question Dr. Adams was a great scholar, who possessed a most accurate and extensive acquaintance with the language and literature of Greece, and he ought to be remembered with special pride, and for all time, by those who practise medicine, as one whose classical attainments and competent knowledge of the French and German languages caused him to stand out prominently during life as a scholar, and enabled him to leave behind him writings which should make his name for ever famous. His translation of the "genuine" Hippocratic treatises is the only complete one in the English language; the same is true of his translation of the seven books of Paulus Ægineta, and of the treatise of diseases by Aretæus, the Cappadocian, one of the most celebrated of the ancient Greek physicians, and who is noticeable because of his dissension from the teaching of Hippocrates when he thought it imperfect or incorrect. By these translations, Adams did as great a service to those members of the medical profession who are not great Greek scholars, as Jacques Amyot (1513-93) did for the general run of French readers by his numerous translations of Greek literature and, especially, by his translation of Plutarch's "Lives" from the Greek into French; and as an English translation of the "Lives" was afterwards made from the French edition, Amyot's dissemination of Greek literature had its effect upon English prose, as well as upon French.

Adams should have a Memorial in the Royal College of Surgeons.

But Adams's claim to distinction is not merely that of a translator of concise and often obscurely expressed Greek treatises, such as those of Hippocrates, but because of the care with which he examined for himself the passages in ancient authors bearing on points open to discussion, and of his erudite "*preliminary discourse*" on the Hippocratic treatises, and the innumerable annotations and references throughout that work. He is said to have made himself acquainted with every extant Greek writing, not Greek medical writings only; and there is ample proof throughout this translation of Hippocrates, of his wide knowledge of Oriental, English, and European commentators and historians who have discussed the works of Hippocrates.

The period at which Hippocrates was practising his profession was "one of the most memorable epochs in the intellectual development of the human race," and Adams shows a familiarity also with the lives of all the great statesmen, artists, and scholars of that time. Indeed, Adams's erudition was so remarkable, and was developed so largely amidst the interruptions and distractions of medical practice, that there ought to be a bust or some other form of memorial of him in the Royal College of Surgeons of England, to mark the honour he is to his College, and to record the extraordinary degree of literary culture to which he attained whilst discharging to the full the duties of a general medical practitioner.

But notwithstanding the truth of the above appreciation of Adams's erudition, some consideration of others ought to be shown before accepting off hand the title accorded to Adams by the *Medical Times and Gazette* (1861) of "Doctissimus Britannorum," and more especially before we claim for him the position of the most learned physician in Europe.

Linacre and Rabelais.

In this connexion something requires to be said about Linacre for England, and Rabelais for France. Linacre (1460–1524) lived at a critical period in the history of learning, when the world was entering on a crisis, passing from the mediævalism of the schoolmen to the wider culture of the "New Learning." Rabelais (1495–1535) came somewhat later, but was one of the most notable writers and thinkers of the early days of the French Renaissance. Linacre had received an incentive to the study of Greek at the Cathedral School at Canterbury, and, after election to a Fellowship at All Souls' College, Oxford, he, with Colet (1467–1519) and a few other Oxford scholars visited Italy, in 1493, and there became imbued with the learning and spirit of the Italian Renaissance. England was a long way behind France and still further behind Italy in exorcising the old conditions of mediævalism and introducing the humanities of the Renaissance; but in Paris, on their way back to Oxford, Linacre and Colet came into touch with the two men who were supreme in their influence upon European scholarship in the latter part of the fifteenth century and the first half of the sixteenth century. These two men were Guillaume Budé (Budæus) and Erasmus, who were exact contemporaries of one another, having been born in 1466–67.

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A WORK demanding that woman, unfitted for anything else by her manifold vices and imperfections, must have her powers curtailed and be restricted to the exercise of her reproductive functions, is something of an anachronism. That her vices result from a biological need is Mr. Ludovici's[1] vindication of her, and the vices are fully and feelingly described. The author writes in the style of the author of "Lovely Woman," but, unlike Mr. Crosland, takes himself seriously; so seriously, indeed, that he regresses to that primitive phantasy which psychologists call "the omnipotence of thought." What he thinks ought to be, is. Fertilisation is a natural process in woman; its absence leads to physiological disappointment, which "sings in chorus with the psychical disillusionment"; then she seeks a co-respondent; hence follows the frequency of divorce. The author thinks this ought to happen, so it happens. The control of conception ought to be harmful, so in the man "ultimate anæsthesia is inevitable." The thesis requires that woman should be unfit for sports; unfit she is, especially during her "moments of indisposition," and her violent sports, by a round-about pathology, lead to "very obscure but severe nervous disorders in later life." Perhaps the account of this last para-physical process only indicates an unquestioning belief in grandmotherly doctrine, and one comes to think that the author's attitude is a defence against the feminine in his own make-up, especially when he tells us (p. 352) that "it is enormously difficult for a woman to divorce her wishes, her likes and dislikes, from her beliefs and from her conclusions."

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[1] Woman: A Vindication. By Anthony M. Ludovici. London: Constable. 1923. Pp. 378. 12s.

After a talk on the national downfall that is about to follow the growth of feminism, the author says, "We cannot now with any pretence of honesty or good faith claim that it is a plunge into the unknown." This tribute to the physical reality of the phantasy concludes a book that is not so startling as the picture on the wrapper would indicate.

"THE FIGHT AGAINST DISEASE."

THE July issue of this little journal, published by the Research Defence Society at the price of 6*d*., and sold by Macmillan and Co., Ltd. (St. Martin's-street, London, W.C. 2), contains the accounts and the Committee's annual report, signed by Lord Knutsford as chairman, together with pithy notes on the world's health, and illustrated articles regarding small-pox at Gloucester and in the United States (with a letter from Prof. Keen of Philadelphia), and tuberculosis treated by heliotherapy in Switzerland. Its pages are few but piquant.

POPULAR ENDOCRINOLOGY.

IN a scholarly little book on "Ductless and Other Glands," recently published (George Allen and Unwin. 4*s*. 6*d*.) Dr. Fred. E. Wynne, the versatile medical officer of health for Sheffield, gives a popular description of the results of recent endocrine research and the application of this knowledge to the prevention and cure of disease. Thyroid, parathyroid, thymus, suprarenal, pituitary and pineal are taken in succession and their secrets laid bare. Finally, Dr. Wynne deals with the ability of extracts of glands to renew the youth of man. In spite of the work of Voronoff on monkey glands, he warns the reader only to accept such conclusions on overwhelming evidence. The cycle of growth, maturity, and decay is a law of nature that governs suns and solar systems, as well as the protoplasm that crawls and swings for a time on the surface of this little planet. Man's only demonstrable immortality is his power to beget and transmit his qualities to his offspring. Dr. Wynne concludes that if youth and maturity were rightly used, if social conditions were what they might be made, old age would be as physiological a period as any other, and probably no less pleasant, a tranquil preparation for a welcome cessation of consciousness.

PUBLIC HEALTH IN NIGERIA.

Mr. A. C. Burns, assistant secretary at Lagos, is responsible for the annual general report for 1922 on the Colony and Protectorate of Nigeria, situated on the northern shores of the Gulf of Guinea. According to this report the general health was good throughout the year, the gravest problem presented during the period being a recrudescence of cerebro-spinal fever in epidemic form. The outbreak declared itself in the north-eastern region of the Kontagora Province—i.e., immediately south of the eastern limit of the epidemic of the previous year. At first its aspect was gravely menacing, but all available precautions were taken, and, in the end, the advent of the rains found it happily still localised within the region of recrudescence, wherein it finally subsided. In the autumn the Emir of Katsina reported its existence in the French territory across his northern boundary, but the end of the year left Nigeria free from the visitation. A "health week" was organised in Lagos in November, and prizes were offered for the healthiest babies and the best-kept compounds. The people were much interested, and an immense quantity of accumulated refuse was disposed of during the week. The population of Nigeria is approximately about 18¾ millions—larger than that of any British dependency except India. There are about 4000 Europeans temporarily resident in Nigeria, chiefly in the employ of the Government, and of mercantile and mining companies. The country is not suited for European settlement. Of the native inhabitants the greater number are of pure negro race, but in the north there are Berber and negroid tribes. The seasons in Nigeria depend rather on the rainfall than on temperature. They are, as a rule, well defined. The dry season, with its attendant "harmattan," commences in the north of the country in October and ends in April. It is of shorter duration in the south, and at Lagos generally lasts from November to March with only intermittent "harmattan." During the "harmattan" (a dry north-easterly wind which brings with it a thick haze composed of minute particles of dust and shell) the nights and early mornings are cold, but the days are very hot, and it is during this period that the maximum diurnal variations occur. Under the heading "General Observations," in Mr. Burns's report, we find the following: "One of the principal religious obstacles to the advance of Christianity in tropical Africa is the prevalence and popularity of polygamy. Among the followers of Islam this institution has, of course, the sanction of religion. Among the non-Muslim tribes it has the equally strong sanction of immemorial custom. In West Africa children are assets rather than liabilities, the daughters being easily marketable as wives at an early age and the sons providing an unpaid labour supply; wives, besides their value as mothers, perform most of the manual labour in the house and on the family farms, but the custom which requires a mother to deny herself to her husband for the period during which she is nursing her child, often from two to three years, is, perhaps, the greatest cause of polygamy. The Native African Church, modelled in other respects on the Church of England, but allowing to its members a plurality of wives, has met the difficulty of those who wished to adopt the Christian Creed without abandoning one of the most cherished of their ancestral customs."

THE PEKING UNION MEDICAL COLLEGE.

THE Peking Medical College grew out of a small dispensary, originally founded at Peking by William Lockhart, of the London Missionary Society, in 1861. The work slowly progressed until the time of the Boxer rising, when all the buildings and plant were destroyed. After the rising, work was begun again in 1906, and various other missionary societies, both British and American, joined together to found the Union Medical College. This College continued to grow until 1914, when the Rockefeller Foundation despatched its Commission to China to study the question of medical education there. As a result the China Medical Board purchased the entire plant and arranged for the complete reorganisation of the school under charter from the University of the State of New York. A volume[1] recently published describes the ceremonies and the conference held in September, 1921, being some 60 years since the foundation of the first medical mission in Peking in 1861.

The College is equipped with the very latest apparatus and plant necessary, not only for the treatment of patients, but also for medical education and research. It is apparently doing admirable work, and, as medicine seems to be the one subject upon which men of all creeds and nationalities can agree, its activities should go far towards bringing about that union between nations in which the hope of the world lies to-day.

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[1] Addresses and Papers; Dedication Ceremonies and Medical Conference; Peking Union Medical College, Sept. 15th–22nd, 1921. Peking, China. 1922. Pp. 416.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, August 13th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 3 P.M., Mr. Simson: Diseases of Women.

TUESDAY.—10.30 A.M., Dr. Paterson: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.

WEDNESDAY.—12 noon, Mr. Sinclair: Surgical Dyspepsia. 2 P.M., Mr. Gibb: Eye Dept. 3 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—10 A.M., Medical Registrar: Diseases of Children.

Daily, 10 A.M. to 6 P.M. Saturdays, 10 A.M. to 1 P.M. In-patients, Out-patients, Operations, Special Departments.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

A Critical Investigation INTO THE THERMAL DEATH-POINT OF THE TUBERCLE BACILLUS IN MILK,

WITH SPECIAL REFERENCE TO ITS APPLICATION TO PRACTICAL PASTEURISATION.

By F. W. CAMPBELL BROWN, M.D.,
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THE thermal death-point of the tubercle bacillus in milk is a question to which many workers have given answers, but so discrepant have been the results that it would appear necessary that this work be revised and any possible previous sources of error eliminated by strict observance of care throughout the experiments. Further, it would appear necessary to have more definite results when one takes into consideration the prevalence of bovine tuberculosis among human beings at the present day—the majority of all such infections being transmitted by the milk of tuberculous cows. Milk-borne epidemics of typhoid, dysentery, &c., are not only historical facts, but also present-day occurrences, and neither the isolation of "carriers," nor the application of the most recent methods for early diagnosis of infectious disease amongst cows and milk workers will make the danger of milk-borne epidemics a thing unheard of. Considerations such as the above have led to the belief that a further attempt should be made to obtain information which would help to render such a universally used and essential food as milk a less dangerous article for consumption in human dietary.

Beneficial methods of treatment other than pasteurisation have been devised and used to render milk sterile. The addition of preservatives—e.g., boric acid, &c.—was sometimes used, but this is not a practice to be advocated. The quality of any such preventive required to destroy the tubercle bacillus in milk would be harmful to the tissues of the human body. Boiling the milk would in all probability destroy the tubercle bacillus, but in this case certain normal constituents of the milk are destroyed, and without these such milk becomes a much less valuable article of diet than in its fresh state. Electrical methods are being adopted in America and in Liverpool with some degree of success. This is an expensive method of treatment, and it has been shown that it is not any action peculiar to the electric current which sterilises the milk. Rather the action is due to the heat set up by the electricity as it flows through the apparatus.

The question of attacking the bovine tuberculosis in the human being at its source—i.e., in the cow—has been receiving much attention in recent years. The application of the tuberculin test, the better supervision of byres, and other factors which lead to healthy non-tuberculous herds, are all steps in the right direction; but to *rid* the country of all its tuberculous cattle is going to take a considerable time, and will require more stringent legislation than is at present in force. Even although tubercle-free herds have been installed throughout the country, pasteurisation will still remain as the best safeguard for getting rid of other contamination from sources other than the cow.

With these points in view, it will be necessary to consider the question of the thermal death-point of the tubercle *bacillus* from every possible angle to enable one to say that the pasteurisation process used is of decided value. The results obtained by previous workers must be noted and their methods carefully considered from the practical point of view.

PREVIOUS ATTEMPTS TO DETERMINE THE THERMAL DEATH-POINT OF TUBERCLE AND OTHER BACILLI.

At varying periods numerous workers have added their names to the now long list of investigators on this subject, giving, for the temperature factor 60° C., time factors varying from five minutes to eight hours as the necessary exposure of the bacilli to that degree of heat in order to destroy them. Many attempts have also been made to state a time factor when the temperature used was 70° C., but here, again, the results recorded are widely conflicting, varying from 1 to 45 minutes' exposure. Table A is a list (taken from Delépine's Food Report No. 79) of results obtained by various workers who used 60° C. and 70° C. as the temperature factors—the temperatures used also in the writer's experiments.

TABLE A.

Investigator.	Temperature used.	Time found necessary to kill the bacillus.
Yersin (1888)	60° C.	10 mins.
Bitter (1890)	,,	5 mins. sometimes enfeebles.
Bonloff (1892)	,,	20 mins.
Forster (1892)	,,	6 hours.
De Man (1893)	,,	1 hour.
Schraeder (1894)	,,	15 mins.
Woodhead (1895)	,,	(*a*) 8 hours (*b*) 45 mins.
Theobald Smith (1899) ..	,,	15–20 mins.
Russell and Hastings (1900)	,,	20 mins.
Hesse (1901)	,,	20 mins.
Rosenau (1907)	,,	20 mins
Delépine (1914)	64°–92° C.	Not killed in 30 mins.
Bang (1891)	70° C.	5 mins. only enfeebles.
Grancher and Lidoux-Lebard (1892)	,,	1 min.
Woodhead (1895)	,,	(*a*) 45 mins. (*b*) 1½ mins.
Morgenroth (1900) ..	,,	10 mins.
Russell and Hastings (1900)	71° C.	1 min.

POSSIBLE CAUSES OF VARYING RESULTS PREVIOUSLY RECORDED.

(*a*) The tubercle bacillus may vary in different cases in its resistance to heat; and in order to get over this difficulty, it is essential that as large a number of different strains as available be tested. Rosenau used five different strains in his experiments, whereas Delépine used milk infected by one animal to which cultures of another strain were added, thus having a mixture of only two strains.

(*b*) Variation of results may also be due to: (1) The fact that the only way to determine whether tubercle bacilli are alive or not after pasteurisation is by animal inoculation, necessitating much delay for obtaining results; (2) the difficulty in some cases in differentiating a lesion seen at post-mortem resulting from dead bacilli from that due to live bacilli; (3) the fact that somewhat similar post-mortem appearances are produced by pseudo-tuberculous lesions, caused by an entirely different organism. Only by searching for acid-fast bacilli can a differentiation be made in such cases.

(*c*) There is also the difficulty in obtaining standard and uniform dosage of bacilli for the animals—it being a well-known fact that the extent and rapidity of spread of the disease depend to some extent on the numbers of bacilli injected. Again, the period of time which elapsed before the animals were inoculated and examined may not have been uniform; and this is important, as Delépine points out that the disease produced by heated bacilli remained latent or occult for some four weeks in his set of experiments. Unless sufficient time elapses before the animals are examined, latent lesions may be missed. This point is brought out in Tables II. and III. of his report.

(*d*) The method of arriving at the exact temperature of the infected milk *must* essentially be taken into account. In all pasteurising plants the milk is *rapidly* raised to the desired temperature, the time taken being only a few seconds.

In the laboratory it is difficult to do this. The time required to raise the infected milk to the requisite temperature is much longer. The organisms are consequently being exposed to the slowly increasing temperature of the milk while the experimenter is waiting for it to reach the desired 60° C. at which the exposure factor comes into play. I am of the opinion that, because the bacilli are being subjected to, say, *50° C. to 60° C.* for a variable period, some may be killed, and all to an extent enfeebled, before the temperature of the milk reaches 60° C. In Rosenau's experiments, the bacilli were added to the cold milk and received a critical heat during the time the milk was being raised to 60° C. before the time factor was taken into account.

(*e*) Further, the method of maintaining a uniform temperature of 60° C. throughout the test, and recording the same, must be provided for. In both these points (*d*) and (*e*), Delépine's experiments cannot be truthfully compared with those of Rosenau's. The temperature used in Delépine's tests was a steadily rising one. On page 41 of his report, the words "the heating of milk from 12° to 78° in 29 minutes" do not agree with the figures given for time and temperature on page 6, and to which the paragraph on page 41 evidently refers. According to the figures on page 6, the time taken to raise the mixture from 12° to 78° was *19 minutes.* The milk remained at or above 60° for only seven minutes, when his sample (3) was taken at 78° and found to contain living bacilli. He also goes on to state in the same paragraph that after ten minutes more the sample (4) taken was found infective. The mixture had not 20 minutes' exposure to heat at or above 60° when this sample was taken, but only 18 minutes. He had no further sample taken for 72 minutes after this, and this was found sterile. His statement, therefore, cannot be correctly used to disprove Rosenau's belief—i.e., that tubercle bacilli are killed in 20 minutes at 60° C.

(*f*) Perhaps of all the possible causes for these varying results the most important is the container used, in which the test milk has been pasteurised; and it is only comparatively recently that more exact methods have been employed. It has been usual for the investigator to heat the infected milk in test-tubes, which were then immersed in a hot water-bath standing at a regulated temperature. With such a method there are two possible sources of error. Firstly, the test-tubes being open to the atmosphere, a surface scum forms on the milk. Bacilli find in this scum a certain degree of refuge from the heat, and a scum such as this will not maintain the same degree of heat as the deeper portions of milk, which will always be in circulation. Smith found that when no scum was allowed to form on the surface of the heated milk, as by heating it in closed vessels, tubercle bacilli were killed at 60° C. in 15 minutes, whereas when a pellicle was allowed to form these organisms survived for one hour at the same temperature. Secondly, there is the obvious danger of splashing the sides of the tube with live bacilli, which may quite easily contaminate the pipettes used for withdrawing later samples, when the bacilli withdrawn from the fully heated portion of the milk are by that time killed. And a further objection is that, by capillary attraction and by withdrawing sample after sample, a film of infected milk is left on the interior walls of the test-tube above the milk level. The inevitable result must be that numerous bacilli escape the full heat for a varying period, and tend slowly to fall by gravity into the bulk of milk, only to reinfect it after it might otherwise have been rendered sterile.

This appears to be the drawback to Rosenau's method, which was that described above. So also Twiss used an open flask when she carried out similar tests, using paratyphoid bacilli in her experiments. Her conclusion—i.e., that the results got by taking small amounts of test samples cannot be taken as proof that all the organisms are killed after periods of exposure used in practical pasteurisation—would appear to be due to the fact that a few organisms remain unexposed to the heat. These are not removed in the small amounts taken for inoculation of "sugars" or animals as the case may be. This vital point has been commented upon by Krumwiede and Noble, who repeated this work. These investigators made a distinct step forward when they adopted the plan of *totally immersing* the milk sample container in the water-bath, thus ensuring that all organisms present were exposed to the required degree of heat for the required period of time. In their experiments, measured quantities of sterile milk were placed in separate containers, submerged in a water-bath till the temperature of the milk reached 60° C. and then the emulsions of organisms were added. Each container with a rubber stopper was then *totally* immersed in the water, removed after a predetermined time, and immediately cooled.

This method undoubtedly has distinct advantages over the open test-tube method, but it is not free from comment. The technique is good, but requires finer detail in order to get absolutely correct and uniform results. First, there is no method of registering the temperature of the milk throughout the experiment. Krumwiede and Noble make no mention of having a thermometer inserted through the rubber cork of the containers. The necessity for this is borne out by the fact that, when I originally thought of employing similar methods in the following tests, I found that by inserting a thermometer through the stopper and placing the container on the bottom of the hot water oven and totally immersing it, the temperature of the fluid inside the container exceeded that of the water bath by 2·5-3° as a rule. On one occasion it was actually 10° warmer. It was not until after many attempts had been made to explain this anomaly that it was found to be due to the fact of the container resting on the metal bottom of the bath, which was warmer than the water. (The bath was heated from below by a gas jet.) On the other hand, if the container was *suspended* in the water and just clear of the bottom of the bath, the temperature inside the container coincided with that of the water in the water-bath. And, further, Krumwiede and Noble make no mention as to whether or not they provided for a lowering of the temperature of the milk standing at 60° C. when the emulsion of bacilli, presumably at room temperature, was added.

The necessity for guarding against this lowering of temperature was borne out by the writer adding 1 c.cm. of emulsion at 37° C. to 5 c.cm. milk standing at 60° C. The result was that the temperature of the milk emulsion at once dropped 7–8° C. And it was several minutes before the temperature of the infected milk rose to the figure (60° C.) at which the time factor comes into play. More especially is this to be considered when results are to be given in such short periods as minute intervals. It is, therefore, necessary before exact exposure periods can be obtained that certain preliminary adjustments be made to the apparatus and temperatures used before beginning any tests on the thermal death-point of any micro-organism. In my experiments such preliminary data were carefully prepared for use with a specially-made apparatus for subjecting infected milk to the degree of heat to be used. These, and the apparatus, will be later described in detail.

Methods Used in Personal Experiments.

The various cultures of tubercle bacilli used in the following experiments were obtained in the majority of cases from tuberculous ox glands, tuberculous milk, human tuberculous sputa, tuberculous joints and bones in man, &c. In addition, a few cultures were obtained from France, Germany, and the United States of America in order to ascertain whether a more resistant type of the tubercle bacillus existed in countries whence cattle are exported for use as human food in the United Kingdom. In all, 35 different sources were used for obtaining strains, some of which might possibly be more virulent or have a greater resistance to heat than the others. All those used were obtained since January, 1921, none being over eight months old, and the majority very much less.

Many weeks were spent in trying to isolate pure cultures from the tuberculous material obtained, and it was not ascertained till numerous attempts had been made by the antiformin method advocated by Muir and Ritchie that the chlorine content of the antiformin varied with different supplies. It became evident that little or no success was likely to be obtained by this method, and the more recent technique, as used by Griffith, was employed, and with much greater success. In this method it matters little whether the chlorine content of the antiformin varies or not, as will be understood by the technique employed by the writer. In this case 10 per cent. antiformin solution was added to an equal volume of the sputa, &c. The mixture was rapidly shaken, and single loopfuls were sown on to culture medium after varying lengths of time—e.g., after exposures of 1, 3, 5, 10, 15 and 30 minutes. In this way a point is reached when all extraneous germs are killed, and only the more resistant tubercle bacilli remain alive. The most usual result found was that the culture tubes inoculated with tuberculous material exposed to the antiformin for less than five minutes were contaminated by the extraneous germs. On the other hand, pure growths of tubercle appeared in either the 5, 10, or 15 (more usually the latter two) culture tubes. Very rarely were any cultures obtained from the tubes inoculated with sputum which had been exposed to this percentage of antiformin for 30 minutes. With such a lengthy exposure the bacilli were evidently killed. In a few cases the bacilli withstood this length of exposure to 10 per cent. antiformin; this was possibly due to the sputum being thicker and more tenacious, as Griffith suggests. In the case of ox glands, shorter exposure of the caseous material was found to give the best growth on media. Such material would appear to protect the tubercle bacilli to a less extent than does tenacious sputum.

The only disadvantage in this method is the necessity of using six tubes of culture material for each attempt instead of one or two. The time used, however, is shorter than in the older method, where so much use of the centrifuge for washing out the alkaline antiformin after exposure to the tuberculous material is necessary. In order to utilise less culture medium small tubes were used for the primary growth, and from the one containing the pure growth subcultures were sown on large tubes in order to obtain sufficiently abundant growths to perform the further experiments.

The culture media used for obtaining growths were either the egg medium advocated by Dorset, or a modification of the same. In some cases Petroff's medium was employed for the original attempts, where pure growths were difficult to obtain, but it appeared that the gentian violet as used somewhat tended to inhibit the tubercle bacilli as well as the contaminating organisms. The best results, especially when the method of sowing as used by Griffith was adopted, were obtained by using ordinary egg medium with sufficient quantity of basic fuchsin added to colour the medium dark pink, as suggested by Cruickshank. By using such a medium the cream-coloured early growth was more readily recognised than when no fuchsin was added. The addition of the fuchsin did not appear in any way to inhibit the growth, which could be observed even in seven days in most cases.

Glycerine was added according to whether the particular strain being isolated was from a human or bovine source, and it must be said that although in more recent views it is held that this substance cannot be relied upon to differentiate between the human and bovine types of this bacillus, the bovine strains did not grow at all, or at any rate only grew very slowly, on glycerine egg. Although this fact was noted, this method was not used for differentiating the various strains used in this series of investigations. After several months, during which nothing was done beyond experimenting with different media and obtaining a sufficient quantity of pure cultures, the total number of cultures exceeded 250 in number. This stock consisted of 35 strains obtained from different sources.

PREPARATION OF INFECTED MILK FOR PASTEURISATION EXPERIMENTS.

An emulsion of 0·2 g. dried bacilli and 1 c.cm. sterile milk was added to 5 c.cm. milk at a temperature of 67° C. in a specially designed flask. The flask was devised so that a thermometer could be kept in its interior. It had also a thin limb with a stopcock at the extremity for withdrawing samples of milk by means of a pipette at various stages of the experiments. The entire apparatus was kept completely submerged in a water-bath standing at 60° C., and only the stop-cock withdrawn momentarily when a sample was required. The effect of adding 1 c.cm. emulsion at room temperature was to lower that of the 5 c.cm. from 67° to 60° C. immediately, thereby enabling the experiment to be commenced at the temperature desired for the duration of the test. This precaution seems to have been overlooked by numerous workers, and would appear to be necessary, especially when the more delicate organisms are being dealt with. The samples withdrawn were of uniform quantity, quickly cooled to 30° C., and then inoculated into guinea-pigs, each pig receiving 0·02 g. tubercle bacilli in 1 c.cm. milk. Heavy infection was aimed at to ensure quick and decisive results.

In all, 25 strains of tubercle bacilli were tested in this manner, ten samples being taken at varying exposure times, and an unheated sample inoculated as a control for each strain. In order to ascertain whether or not all the bacilli were killed and none remained unexposed (in the apparatus) to the heat, organisms giving more rapid reactions than tubercle bacilli were used. That no live bacilli had escaped inclusion in the samples was proved by inoculating the whole flask and its remaining contents in suitable culture media.

INOCULATION OF TEST ANIMALS.

The guinea-pigs were inoculated at the flexure of the thigh, and each series was isolated from those used for the different experiments. No animal was killed before the tenth week after inoculation, in order to allow time for latent disease to become manifest, and in cases of doubt reinoculation with the doubtful lesions were made. The presence of the disease in the positive animals was in most cases quite definite, being made manifest by abscess-formation at the site of inoculation, enlargement of lymphatic glands, presence of tubercles or necrotic areas in the liver, spleen, lungs, &c.

RESULTS OBTAINED.

These are given in detail in the tables, which contain only a summary of the results obtained, and do not convey to the reader any idea of the vast amount of time and work spent in carrying out these experiments. The animals used, including those required for reinoculations, exceeded 280 in number; and the time taken in carrying out this part of the tests alone—i.e., in inoculating, supervising, and performing autopsies on them—extended over six months.

Tables I. and II. give all the results obtained with 15 bovine strains, using 60° C. as the temperature factor. It will be noted that in the great majority of cases ten minutes' exposure to this degree of heat is not sufficient to prevent the bacilli from causing tuberculosis in the guinea-pig, while even 15 minutes is not sufficient in some cases. However, a period of 20 minutes was found either to kill the bacilli or so to enfeeble them that the protective forces in the guinea-pig were able to prevent the latter from becoming tuberculous. Three strains, Nos. 3, 7, and 12, gave rather doubtful results after 20 minutes' exposure, but on reinoculation with the doubtful lesions no tuberculosis developed in any of the animals used. It was unfortunate that the control animal for strain No. 13 died accidentally, but the fact that the animals given this strain heated for 10 and 15 minutes developed tuberculosis proves that the strain was a virulent one, and it has therefore been included with the others in Table I.

TABLE I. (BOVINE STRAINS).—*Infected Milk subjected to 60° C. for Varying Exposures as stated below.*

Strain	C	Time of exposure at 60° C. (in min.)					Strain	C	Time of exposure at 60° C. (in min.)				
		10	15	20	25	30			10	15	20	25	30
1	+	+	–	–	–	–	9	+	–	–	–	–	–
2	+	+	–	–	–	–	10	+	–	–	–	–	–
3	+	+	+	–?	–	–	11	+	+	+	–	–	–
4	+	–	–	–	–	–	12	+	+	–	–?	–	–
5	+	+	–	–	–	–	13	–	+	+	–	–	–
6	+	–	–	–	–	–	14	+	–	–	–	–	–
7	+	+	–?	–?	–	–	15	+	+	–	–	–	–
8	+	+	+	–	–	–							

C, Control animal. +, Tuberculosis found at autopsy.
–, No tuberculosis found at autopsy.

Result.—All rendered non-lethal at or before 20 minutes' exposure to 60° C. *Refer to Table II. for doubtful cases.*

TABLE II.—*Confirmation Tests from Doubtful Lesions of Guinea-pigs in Table I.*

Strain.	Lesion from animal treated with milk at 60° C. for :—	Guinea-pig.	Guinea-pig.
3	20 minutes	–	–
7	15 ,,	–	–
7	20 ,,	–	–
12	20 ,,	–	–

Result.—Doubtful lesions as recorded in Table I. were found to be caused not by living but possibly by dead bacilli.

TABLE III. (BOVINE STRAINS).—*Infected Milk subjected to 70° C. for Varying Exposures as stated.*

Strain	C	Time of exposure at 70° C. (in min.)					Strain	C	Time of exposure to 70° C. (in min.)				
		1	3	5	10	15			1	3	5	10	15
1	+	+	+	–	–	–	9	+	–	–	–	–	–
2	+	–	–	–	–	–	10	+	+	–	–	–	–
3	+	+	–	–	–	–	11	+	+	–	–	–	–
4	+	+	–	–	–	–	12	+	+	+	–	–	–
5	+	+	–	–	–	–	13	+	+	+	–	–	–
6	+	–	–	–			14	+	+	–	–	–	–
7	+	+	+	–	–	–	15	+	–	–	–	–	–
8	+	–	–	–	–	–							

Result.—No virulent bacilli were found after 5 minutes' exposure to 70° C.

Table III. gives the results when the infected milk was heated at 70° C., using the same 15 strains of bovine tubercle bacilli. In this case no tuberculous lesions developed in any of the animals inoculated with infected milk which had been exposed to a temperature of 70° C. for five minutes. While the essential object of these tests is to determine the thermal death-point of the bovine type—the type which is most likely to be found in cow's milk—yet it should be borne in mind that there is always the possibility of contamination of milk by the human type of the bacillus. Contamination with the latter may occur from tuberculous dairymen. It is important, therefore, that the thermal death-point of the human type also be ascertained. For this purpose ten human strains were tested, and the results obtained are given in Tables IV. and V. It will be observed that there would appear to be little or no difference in the thermal death-point between the bovine and human types of this organism.

TABLE IV. (HUMAN STRAINS).—*Milk Infected when at 67° C. and Mixture kept at 60° C. throughout Exposure Periods.*

Strain	C	Time of exposure to 60° C. (in min.)					Strain	C	Time of exposure to 60° C. (in min.)				
		10	15	20	25	30			10	15	20	25	30
1	+	+	–	–	–	–	6	+	+	–	–	–	–
2	+	–	–	–	–	–	7	+	+	–	–	–	–
3	+	+	–	–	–	–	8	+	+	+	–	–	–
4	+	–	–	–	–	–	9	+	–?	+	–?	–	–
5	+	–	–	–	–	–	10	+	+	–	–	–	–

Result.—In all cases an exposure of 20 minutes at 60° C. was sufficient to render the bacilli non-virulent. Reinoculation of doubtful results got with No. 9 proved negative.

TABLE V. (HUMAN STRAINS).—*Milk Infected when at 77° C. and Mixture then kept at 70° C. throughout Experiment.*

Strain	C	Time of exposure to 70° C. (in min.)					Strain	C	Time of exposure to 70° C. (in min.)				
		1	3	5	10	15			1	3	5	10	15
1	+	–	–	–	–	–	6	+	+	–	–	–	–
2	+	–	–	–	–	–	7	+	+	–	–	–	–
3	+	–	–	–	–	–	8	+	–	–	–	–	–
4	+	+	+	–	–	–	9	+	+	+	–	–	–
5	+	+	–	–	–	–	10	+	–	–	–	–	–

Result.—No virulent bacilli remained after 5 minutes' exposure to 70° C.

I believe that, when tuberculous milk is *heated either at 60° C. for 20 minutes or at 70° C. for 5 minutes, it can safely be assumed that the bacilli are killed.* If they are not actually killed, they are so enfeebled that the normal powers of resistance of the guinea-pig find the former an easy prey, and no tuberculosis develops. This statement can in all probability be applied to man. More especially is this the case when it is not to be expected that the milk he drinks would ever contain such numbers of bacilli as have been given to the guinea-pigs, each guinea-pig receiving 0·02 g. of pure culture as a dose. Therefore, *tuberculous infection* from milk treated with either of these two combinations of temperature and time factors may be entirely disregarded from an administrative public health point of view.

But because either method of treatment will render milk free from infection, the effect of heat on the other constituents of the milk must not be disregarded; and it is now necessary to consider if both methods of treatment may produce equally good effects, or if there are sufficient grounds for preferring one as opposed to the other.

There is evidence to show that the organisms producing *lactic acid* in milk prevent the *development of spore-forming organisms of the putrefactive group.* Therefore, the presence of the former in the treated milk is an advantage. Further, the effect of prolonged exposure to temperature exceeding 65° C. has been shown to destroy valuable enzymes in the milk; and also the fat globules may be broken up, and the "cream line" lost.

The question of the effect of *heat on enzymes* in milk has been studied by many workers, and the results obtained are given by Race. His results show that exposure to temperatures of 65° C. and under for a period of 30 minutes has no effect on the enzymes found in fresh milk. Numerous workers quote figures dealing with this question, but the most recent and probably the most accurate authority on the subject is McCollum, who has done so much valuable recent work on the nutritional value of various foodstuffs. The work of Hess and of McCollum together indicate that the effect of different degrees of heat on the nutritional value of milk is extremely important in the consideration of scurvy in infants.

Scurvy is considered by these workers as of bacterial origin, but the reasons cannot be gone into here. Sufficient it is to quote the *conclusions come to* by them. These are that milk heated to 74° C. for *30 minutes* is more liable to cause scurvy than milk which has been pasteurised at 63° C., or boiled. The explanation given is that at 74° C. nearly all the lactic acid-forming bacilli are killed, and so the spore-forming bacilli alone remain, and in time bring about putrefactive decomposition. Further evidence is given to show that stale pasteurised milk *augments* the danger of development of scurvy in infants.

They further add that pasteurisation in itself does not seem to have any influence in lowering the nutritive *value of milk, but that pasteurisation should be carried out at the lowest temperature which will destroy the action of pathogenic organisms, and the milk consumed soon after treatment.*

With these facts in view it would, therefore, appear that the "flash" system as carried out in the majority of dairies in this country is inferior to the "holding" system, for the following reasons:—

(1) Exposure to 70° C. for a mere matter of a few seconds does not destroy the action of the tubercle bacillus.

(2) By killing the harmless lactic acid-forming bacilli, the harmful putrefactive organisms are more readily allowed to develop; and further—

(3) The fact that souring is prevented allows the milk to remain "sweet" to the housewife, whereas if "sour" it would not be used (vide ante—Scurvy).

(4) The possibility of the lactose becoming scorched, the casein hardened, and the calcium, magnesium, and phosphoric salts precipitated, and also the commercial objection—viz., the "cream line" being interfered with.

As the "holding" system, using a temperature of 60° C. and holding the milk thereat for at least 20 minutes, seems to have all the advantages and none of the disadvantages of the "flash" system, it is to be preferred.

CONCLUSIONS.

1. It has been shown that by using 25 strains of the tubercle bacillus no wide difference in the thermal death-point is found.
2. The thermal death-point of this organism is practically similar for human and bovine types.
3. The previous wide variations in results have been due to too little care in carrying out the experiments, and to the fact that the lesions caused in test animals had not previously always been given sufficient time to develop and be accurately diagnosed.
4. If a temperature of 60° C. be used, it requires 20 minutes' exposure to this degree of heat to prevent milk so treated carrying infection to the guinea-pig.
5. If a temperature of 70° C. be used, it requires five minutes' exposure to ensure the same results.
6. Of these two combinations of time and temperature factors, the former excels the latter, when the *food value* of the treated milk is also considered.
7. The writer is of opinion that, until bovine tuberculosis can be stamped out at its source—namely, in the ox—proper pasteurisation of milk is the *only* safe method of rendering milk safe as a diet for human consumption.

Note.—Since the completion of these results in 1922 it is interesting to note that, by the passing of the Milk and Dairies (Amendment) Act, 1922, and the issue of the Milk (Special Designations) Order, 1922, made by the Minister of Health under Section 3 of the said Act, *legislation now exists* whereby until July 1st, 1923, any process of pasteurisation (including the "flash" process) capable of effecting the necessary reduction of bacteria was permitted. Subsequent to that date suppliers of pasteurised milk must conform to certain conditions if the milk is to be sold as pasteurised milk. One of these conditions compares favourably with my results—namely, that the milk must be retained at a temperature of not less than 145° F. (approx. 63° C.) and not more than 150° F. (approx. 66° C.) for at least 30 minutes; also that no other treatment of heat may be adopted. These limits of temperature and duration of exposure give a safe margin as far as ensuring the destruction of any tubercle bacilli in milk thus treated.

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ANTE-NATAL DIAGNOSIS.*

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THIS is a large subject, and I propose dealing with it strictly from the clinical point of view, laying stress on the methods by which a diagnosis is come to. With it is very closely associated the actual diagnosis of pregnancy itself. Success in diagnosis is based on a routine method of examination, and the recognition of abnormal conditions on a wide experience of the normal.

The patient should always be prepared by emptying the rectum and bladder. The latter can be a particular source of trouble. Conditions which hinder diagnosis are nervousness on the part of the patient, difficulty in adopting the abdominal type of breathing, stoutness, and unduly developed musculature of the abdominal wall. The results of nervousness can usually be obviated by paying attention to the history and by examining other parts, such as the breasts, before beginning to palpate the abdomen. None of the manipulations involved in making a complete diagnosis should hurt a normal patient. Gentleness and patience are repaid many times over by the results obtained.

Early Stages of Pregnancy.

The diagnosis of pregnancy is usually possible from the end of the second month. In the history, points of value are amenorrhœa, a history of morning sickness, and pain and tenderness of the breasts. On examination at from eight to ten weeks the breasts rarely show anything of diagnostic value. On abdominal palpation one is usually conscious of some resistance above the symphysis pubis. Vaginal examination shows that there is some softening of the cervix, and that the body of the uterus is enlarged, softened, and rounded. I do not lay much stress on Hegar's sign, which can only be obtained if the abdominal wall is very lax. The increased width of the uterus is a useful aid to diagnosis, particularly as it can be estimated by the vaginal fingers alone where, for one reason or another, bimanual examination is difficult. Thus it is particularly useful in cases of retroflexion. The fornices should be palpated for any abnormality.

Patients rarely pay a visit at this stage of pregnancy, except for confirmation of its existence or for a diagnosis, where the history is unusual. Yet a visit at this time is important ante-natally, for many miscarriages result from retroflexion of the uterus, and at this stage a mobile retroflexion can readily be put right, either by postural exercises or, in severer cases, by the use of a watch-spring pessary.

Twentieth to Twenty-second Weeks.

A stage at which many patients pay a first visit is about the twentieth to the twenty-second week of pregnancy. To the history of amenorrhœa are now added the facts of "quickening" and swelling of the lower abdomen. As regards "quickening," it is usually stated that it occurs between the eighteenth and twentieth weeks of pregnancy, but many patients say that they are conscious of fœtal movement considerably earlier than this. On the other hand, movements of flatus in the intestine can be mistaken for fœtal movement; patients who have already had several children come for confirmation of the presence of pregnancy, complaining of fœtal movement, when they are not pregnant at all.

On examination at 20 to 22 weeks the breast signs are of great importance in primigravidæ. Occasionally they are not conspicuous. The linea nigra shows in the lower abdomen and a definite median swelling is seen and felt there. External ballottement shows the presence of fœtal parts, and the fœtal heart is sometimes heard with surprising distinctness. Even if the fœtal heart is not heard, fœtal movements can frequently be heard as well as other signs of activity, such as the uterine souffle. At this stage vaginal examination confirms the diagnosis, but is not always necessary for this purpose. There is early congestion of the vaginal mucosa, softening is marked, and the swelling in the abdomen can be proved bimanually to be the uterus. Internal ballottement can be produced in the anterior fornix.

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* A paper read at a meeting of the London Association of the Medical Women's Federation.

Pelvimetry.

Varying with the circumstances of the case, I always consider the size and shape of the pelvis at this, or at an earlier visit, as a guide for the future of the case. It is important to note the stature of the patient. When she lies on her back on the couch, one considers her general outline. A useful "grip" is made by resting the ball of either thumb on the anterior superior spine of the pelvic crest, and clasping the crest in one's hands (Fig. 1). This gives information as to the general size and symmetry of the pelvis; it shows whether the intercristal measurement is greater than the interspinous, and indicates the antero-posterior measurement of the pelvis. One then takes the ordinary measurements, the interspinous, intercristal, and external conjugate.

Internally, I examine the capacity of the pelvis with the patient in Sims's position, judging the width of the pubic arch, sweeping round either side of the pelvis for any abnormality and reaching up towards the promontory. It is difficult to be sure of the promontory unless one can reach slightly beyond it to the beginning of the lumbar curve, and this is only possible when there is contraction of the diagonal conjugate. The resistance of the perineum may play an important part in preventing one from reaching the promontory. Pelvimetry, especially in its wide sense of judgment of the size and shape of the pelvis, is of great importance to the examiner as a guide, but except in extreme cases the crux of the case comes later in the judgment as to whether the particular head in question will pass through the pelvis or not.

First and Second Pelvic Grips.

At 34 to 36 weeks complete ante-natal diagnosis is possible, and I propose going rather fully into the description of a method by which I find students and nurses soon learn to build up a sound diagnosis for themselves.

With the patient's date in mind, first note the general size, shape, and prominence of the abdomen, and also the height of the fundus uteri. The first pelvic (Pawlik's) grip is then made. For this the patient lies extended, breathing freely, and the examiner faces her. The hand is laid above the symphysis, taking the widest possible grip, and as the patient expires each time it is sunk a little deeper into the abdomen (Fig. 2). In favourable cases the hand now finds itself gripping the fœtal head, and it can be determined right away whether this is movable or fixed in the pelvis, and, by manipulating the hand slightly, whether flexion is present. Thus, by this grip alone a complete diagnosis of the lie of the fœtus may be made, and the remaining grips are only confirmatory. If the head is not felt by this grip and the succeeding one, it must be sought elsewhere before an attempt is made to discover other parts of the fœtus.

The second pelvic grip is now taken, facing the patient's feet, with her thighs and knees slightly flexed to relax the abdominal muscles. Again, a wide grip is taken, capable of enclosing the whole head, and the finger tips are sunk downwards and backwards, again with each expiration, until the presenting part is felt between the hands (Fig. 3). This grip is perhaps even more useful than the first, and in most cases confirms it. A head that appeared fixed sometimes shows itself somewhat movable, when the muscular tension is relieved, and occasionally the flexion of the head is found to be towards the opposite side from that expected. This is because the Pawlik grip does not always admit of the palpation of that part of the head which lies posteriorly.

Fundal Grip, &c.

The fundal grip is now practised and is of particular importance when the head has not been found at the pelvic brim, when there is uncertainty as to whether the presenting part is the head or not, or when multiple pregnancy is suspected. It is most important to find the head before proceeding further with the diagnosis. If the head is at the fundus its main bulk rests to one side or other of the middle line and two grips are taken accordingly, the hands being placed sufficiently widely apart to allow of the enclosure of the whole head (Fig. 4). I impress the importance of width of grip because I find that beginners rarely make it wide enough. The deciding points about the head are its firmness and roundness, the fact that it ballottes between the examining hands, and that it is divided from the rest of the body by a definite gap. Ballottement of the head at the fundus can also be obtained by laying one hand over the prominence produced by it and shaking it within the convexity of the hand. The breech never moves sufficiently to give this result.

To decide where the fœtal back lies, a useful grip is one by which the resistance of the two sides of the lower abdomen is compared. The fingers of one hand are spread between the anterior superior spine and the umbilicus and sunk deeply into the abdomen (Fig. 5). The same hand is used in exactly the same way on the other side. This shows at once whether the back is anterior or not, and by the definite resistance of one side on which side it is. Confirmation is obtained by holding the uterus in position with one hand while palpating with the other, and vice versa. The fœtal heart is now sought according to the diagnosis made and used as a confirmatory sign of diagnosis.

Engagement of the Head in the Pelvis.

It used to be taught that in primigravidæ the head did not begin to engage until the thirty-sixth week of pregnancy, and then gradually sank down into the pelvis, and that in multigravidæ engagement did not occur until labour began or shortly before this. We must consider what produces engagement of the head and what determines a difference between primi- and multigravidæ.

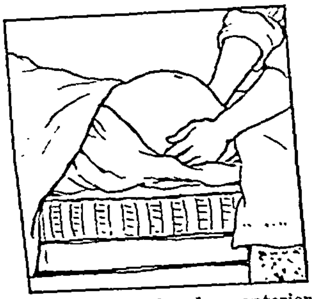
As pregnancy advances stretching of the uterine and abdominal walls increases, and, given a normal pelvis and fœtal head, the tension produced thereby overcomes the resistance offered by the pelvis and the structures in it, and the presenting part engages in the pelvis. The tension is greater in primigravidæ because neither the uterus nor the abdominal wall has been stretched before; hence the fœtal head usually engages early, but in multigravidæ with well-preserved musculature engagement occurs also. Usually engagement has begun at 34 weeks. Occasionally we find a head quite deep in the pelvis at 28 to 30 weeks. If the head has not engaged, or does not show signs of engaging, by 36 weeks in a primigravida the reason must be carefully sought. If the pelvis is small or asymmetrical the fact is already known. The head may be large or in a bad position; a loaded rectum will push the head out of the pelvis, and a low-lying placenta acts in the same way. The grip I now use to the exclusion of others to determine whether a head is likely to go through a given pelvis or not, is one by which I press down the fœtus towards the pelvic brim from the fundus, when the abdomen is lax, and lay the other hand flat just above the symphysis (Fig. 6). Having made a careful diagnosis of the presentation and position of the head previously, I then judge by the amount of overlapping present.

Maturity of the Fœtus.

It is important to be able to give a sound opinion on the maturity of the fœtus for two reasons: first, to be able to give advice to those who require it, as, for instance, to a mother who has conceived during the amenorrhœa of lactation; and, secondly, to determine whether the patient's dates are reliable. The question of maturity can be decided only as a judgment on the average find, since normal full-term infants vary so considerably in size, and such signs as deep engagement of the head may be altogether misleading. First note the height of the fundus uteri and the general size of the abdominal swelling; then, if the fœtus is sufficiently mature, note the size of the head and its position as regards the pelvis—whether floating above the brim, engaging at the brim, or deep in the pelvis.

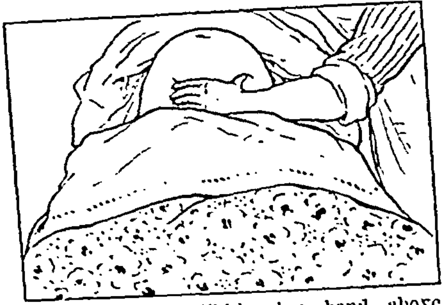
Until the uterus reaches the umbilical level at about 22 weeks the height of the fundus is a fairly good guide; after this all the points above must be taken into consideration together. I rely most on the size of the fœtal head, and, gripping this with one hand and the breech with the other, consider the size of the child. It is well in multigravidæ to find out the weight of former children at birth.

FIG. 1.



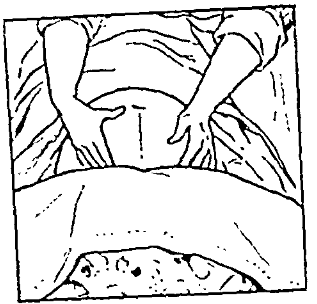
Ball of either thumb on anterior superior spine of pelvic crest, the crests being clasped in the hands.

FIG. 2.



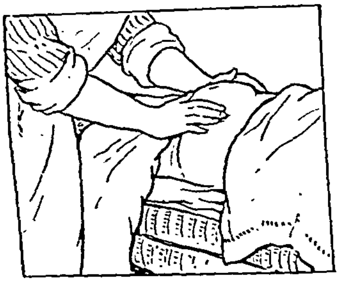
First pelvic (Pawlik's) grip; hand above symphysis pubis, as widely extended as possible, to grip the fœtal head.

FIG. 3.



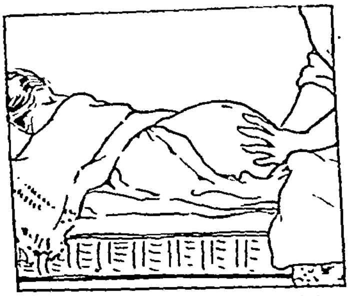
Second pelvic grip. The position of the hands indicates flexion of the head towards the right side.

FIG. 4.



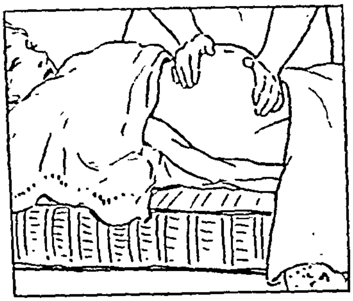
Fundal grip; width of grip is important.

FIG. 5.



Grip to compare resistance of two sides of lower abdomen.

FIG. 6.



Grip to determine likelihood of passage of fœtal head through pelvis.

When testing the size of the abdominal swelling and that of the fœtus as compared with the patient's dates, one's attention is drawn to a number of abnormalities, and to the question of multiple pregnancy. If, for instance, we find an abdomen abnormally large for the date, with a head of medium or small proportions, it often pays to search for a second head.

Presentation and Position of the Fœtus.

In the early stages of pregnancy the position is unstable. At 28 to 30 weeks breech presentations are common. Spontaneous version is still liable to occur between 32 and 34 weeks, but after this it is rare. It is interesting to note how often there is change of position in vertex presentations late in pregnancy when the fœtus appears to have settled down to its final position. I have noticed this often, and recently examined a patient at weekly intervals four times running, shortly before delivery, and found L.O.A. and R.O.A. alternatively. The fœtus also quite often takes up positions that do not come into the usual classification.

With regard to the turning of breech presentations, I do not attempt external version until about the thirty-fourth week, since there is still likelihood of its occurring spontaneously. If left later than this date there is often difficulty in performing version on account of the size of the child—the head gets under the costal margin, the breech is engaged in the pelvis, and it is difficult to obtain a grip upon it. In performing version, if the breech is engaged, the patient must rest in the Trendelenburg position until it is disengaged. The head is taken in one hand, the breech in the other, and it is just as important to push the breech up as to draw the head down. No actual force should be used and the manipulation ought not to hurt the patient. If version does not occur with comparative ease, I allow the presentation to persist in normal multigravidæ and in primigravidæ with well-shaped and good-sized pelves. Death of the fœtus or accidental hæmorrhage may occur after version, and the risk of breech delivery in these cases is not great. In primigravidæ with small or even medium-sized pelves version should be performed under an anæsthetic if necessary. An extended breech will rarely turn, since the legs act as splints preventing flexion of the body.

The Fœtal Heart.

In listening for the fœtal heart, it is always wise to take the patient's pulse also. Rapidity of her heart action may be produced through nervousness, and confusion between the two is possible. A monaural stethoscope with a wide base for collecting sound is the most satisfactory instrument for all-round use. Until about the twenty-second week the fœtal heart is often inaudible. Occasionally it is surprisingly distinct, depending largely on the nearness of the fœtal back to the abdominal wall. Until 26 to 28 weeks, when the position of the child begins to stabilise, it is best to listen for the heart over the uterus in the middle line and, if it is not heard there, over some solid part o the fœtus determined by palpation. After the child has adopted a stable position, in all presentations when the back is anterior, the heart is heard best over that part of the back nearest to the heart. It i according to this known position, determined already by palpation, that it should be sought and its intensity compared with that in other positions in cases o doubtful diagnosis. In a vertex presentation with engaged head, the point of maximum intensity i roughly on a line drawn from the umbilicus to the anterior superior spine of the pelvic crest; if the hea floats freely above the pelvis it is higher than this. I breech presentations the point of maximum intensity is rarely above the umbilicus—the head is above the umbilical level, the back below it. Only in those cases where the child's head is under the costal margin—i.e., towards full term with a large child—does one hear it best at the umbilical level or above it. In posterior positions the heart sounds are conducted indirectly, and may not be best heard at the point nearest the heart.

DIAPLYTE TUBERCULIN.

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The arrival among us of a new tuberculin—for Dreyer's antigen is no less than this, though we may hope it will prove more—again brings into prominence the important subject of dosage and administration of these substances, powerful for harm as well as good, and necessarily given at the start in doses almost immeasurably small. Tuberculin, especially in the treatment of pulmonary tuberculosis, has fallen into practical disuse in this country during the past ten years, and I find but few of the younger physicians among us have had experience of its administration. Our pathologists, moreover, though well versed in the small infrequent dosage suitable to the treatment of localised tuberculosis, have for the most part ignored the method of frequent and rising dosage accepted all the world over as applicable to the treatment of pulmonary and other forms of autotoxic tuberculosis. Under these circumstances I am tempted to restate some of the essentials of safe administration under the latter method, especially with a view to the avoidance of unexpected large reactions which may vitiate the success of the method and imperil the recovery of the patient. I shall speak only of dosage and of method of administration.

Preparation of Antigen.

The preparation of the antigen for injection demands (1) a diluent, in this case sterilised normal saline containing 0·15 per cent. formalin; (2) an accurate tuberculin syringe graduated in 1/10, the barrel for accuracy being about 8 cm. long (syringes of the Record type are the best); (3) a long 10 c.cm. graduated measure or pipette; and (4) some 10 c.cm. stoppered bottles. 1 c.cm. of the "original solution" (in this case Dreyer's antigen) with 9 c.cm. of the diluent now makes dilution 1, whose bottle is so numbered; 1 c.cm. out of this bottle (dil. 1) with 9 c.cm. of diluent now forms dil. 2; and 1 c.cm. of dil. 2 with 9 c.cm. of diluent makes dil. 3, and so on, each dilution being 1/10 strength of the one above. Now it is obvious that 1 c.cm. of dil. 1=0·1 c.cm., 1 c.cm. of dil. 2=0·01 c.cm., and 1 c.cm. of dil. 3=0·001 c.cm. of "original solution," and so on. This is to state the dose in fluid measure, which is now always done for convenience, and also for avoidance of misunderstanding (since Koch often spoke of milligrammes when he meant cubic millimetres, and, moreover, discussion arose as to the solid contents of T.R., which was made from 10 mg. of tubercle bacilli per c.cm., but found to contain whenever completed only 2 mg. of solid substance (Wright; Ruppel)). If it is demanded, for Dreyer's antigen, that a dose be stated in mg. of solid substance, then this is easily arrived at by dividing the dose in c.cm. by 5 (since 1 c.cm. contains 0·2 mg. of antigen). Thus 1 c.cm. of *dil.* 3 contains 0·001 c.cm. of original solution, or 0·0002 mg. of solid antigen, and 1 division (1/10 c.cm.) of syringe 1/10 of this, or 0·000 02 mg.

Now when we come to the matter of initial dosage we find that Dreyer's antigen is weaker than any of the tuberculins in common use—it may, perhaps, for convenience be considered to be 1/10 strength of T.R., the weakest of the older tuberculins whose initial dose could be safely put at 0·001 c.mm., or 0·000 001 c.cm.—i.e., 1 division (1/10 c.cm.) of *dil.* 5. With Dreyer's antigen it should be safe, even in febrile cases, to commence with a dose 10 times this strength—i.e., 1 division (1/10 c.cm.) of *dil.* 4. In afebrile cases a dose of 2½ or 5 divisions (¼ or ½ c.cm.) of dil. 4 should be safe, this latter representing 1/100 000 mg. of the solid antigen.

Dosage.

So much for dose nomenclature, which need, fortunately, no more be bothered with once the initial dose is decided on. After that the dosage runs up in divisions of the 1 c.cm. syringe from one diluent to the next, from dil. 4 to dil. 3, to dil. 2, and so on. It is, in especial, of the method of graduating this rising dosage that I wish most emphatically to speak. It is here that danger to the patient arises, since avoidance of unexpected reactions (I shall say nothing here of reactions deliberately forced!) depends very closely on the smoothness of this upward gradient of dosage. Now it is obvious that if we rise in divisions of the syringe 1, 2, 3, 4, 5, 6, 7, 8, 9, that is in arithmetic progression, that the rise from 1 to 2 is doubling while the rise from 8 to 9 is but an increase of 1/8—the rise 1 to 2 is a "cliff" in dosage at which a "reaction" is likely to occur. Tuberculin administrators have got over this difficulty by making such a sequence as 1, 1·5, 2, 3, 5, 7, 10, 15, &c., but this is, after all, but a rough and ready device which meets the need but partially. It does not really do away with "cliffs," and it condemns us to a rapidity of rise which may not suit the particular case under treatment. We require, not only a smooth rise, but a rise whose steepness we can modify to meet the individual case. The only logical way to achieve these two ends is by the use of a table where doses rise in geometrical progression, always by the same multiple, however small, and where many different gradients are provided to choose from. Such a table was prepared for Lawrason Brown in the past, and a modification of it, made by Egbert Morland for a book on Tuberculin Treatment in which he and I collaborated,[1] is here in part reproduced. In this table the numbers refer to divisions of the 1 c.cm. tuberculin syringe (which must be divided in 1/10). Since no more than 1 c.cm. can be given with this syringe no mistake can be made with these numbers, and the decimal point may be put in or omitted as desired. Having ascended a column of dosage on one dilution, we pass to the next stronger dilution and work up it on the same basis, 1 division (1/10 c.cm.) of the new, stronger dilution being equal to 1 c.cm. of that we are leaving.

10·0	10·0	10·0	10·0	10·0	10·0	10·0	10·0
4·6	5·6	6·3	6·8	7·5	7·9	8·3	8·6
2·2	3·2	4·0	4·6	5·6	6·3	6·8	7·4
	1·8	2·5	3·2	4·2	5·0	5·6	6·5
		1·6	2·2	3·2	4·0	4·6	5·4
			1·5	2·4	3·2	3·8	4·65
				1·8	2·5	3·2	4·0
				1·3	2·0	2·65	3·4
					1·6	2·2	2·9
					1·3	1·8	2·5
						1·5	2·15
						1·2	1·85
							1·6
							1·4
							1·2
1·0	1·0	1·0	1·0	1·0	1·0	1·0	1·0
3	4	5	6	8	10	12	15

With such a table the initial dose, generally much below the patient's reaction point, may be rapidly pushed up, on a basis of 3 or 4 doses to each dilution or by doubling (a convenient plan), till it begins to be effective, and thereafter a basis of, say, 10 or 12 doses to each dilution (see Table [10] and [12]) may be used to continue the treatment. In recording the dosage it is convenient to put the "dilution" as a number in a circle, and the "basis" of dosage—i.e., its gradient—as a number in a square. Thus at a glance the whole dosage and method are made apparent. For instance, starting with 2·5 divisions of the syringe in dil. 4, the doses might read as follows: (4) 2·5, (4) 5, (4) 10 (or (3) 1 which is the same), (3) 2, (3) 4. At this point, up to which we have doubled, let us suppose evidence of "reaction," that is, that the dose has now become "effective." Now we need to get on to a slower "basis," let us say [10], and we continue (3) 5, (3) 6·3, (3) 7·9, (3) 10, (2) 1·3, (2) 1·6, &c.

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[1] Tuberculin Treatment. London: Oxford Medical Publications. Second edition. 1913.

Of the means whereby control of dosage is attained, that is reactions and "subreactions," I shall not speak here, except to remark that it seems likely "local reactions" will play small part in control of dosage by Dreyer's antigen, and that hence we must be all the more watchful for slight effects on temperature (both down and up) and on general symptoms, as indications that the "threshold of response" is reached, and a more sloping gradient of dosage indicated.

If much of the foregoing seems elementary and obvious may I plead first the supreme importance to our patients that it should be understood by all; secondly, the extraordinary ease with which mistakes in tuberculin dosage may be, and have been, made; and, thirdly, the importance that any "new era" should escape disaster at the outset. If this communication is the means of spreading the use of "geometrical dosage" I feel that it will have served a useful purpose.

THREE CASES OF BILATERAL RENAL CALCULUS.

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THE following cases illustrate some important points in the diagnosis and treatment of bilateral renal calculi.

CASE 1.—Female, aged 31, was admitted to the Norfolk and Norwich Hospital on August 9th, 1921, complaining of pain in right side of abdomen.

History.—The patient stated that during the last six years she had suffered with occasional attacks of pain in the right side of the abdomen, the pain radiating into the right loin. The attacks of pain varied in severity, but on five or six occasions she was confined to bed for about a week. The severe attacks were followed by the passage of small stones with the urine; and on five or six occasions she had passed at least 12 stones during each attack. She had never, so far as she knew, passed any blood in the urine. On August 5th, feeling quite well, she went to the seaside; on the 6th she was seized with a very severe pain in the right side of the abdomen. The urine was thick and she passed it frequently with severe pain. On the 7th she returned home and was admitted to hospital on the 9th.

Condition on Admission.—The patient is a pale, ill-nourished weakly-looking woman. Temperature 100° F., pulse 98, respirations 24. Eyes: pupils equal reaction to light and accommodation; tongue furred. Chest: thin, moves well and equally; lungs normal. Heart: apex beat fifth space inside nipple line; sounds normal. Abdomen: not distended; abdominal wall thin and lax. A swelling, seen descending below the right costal margin, moved on respiration. The swelling was easily palpated; it had well-defined margins, did not cross the middle line, was easily pushed back into the loin; its manipulation caused much pain. The swelling was resonant. Several hard bodies like renal calculi could be felt; on manipulation a sensation of crepitus was also felt. Left kidney not palpable or painful.

Urine, specific gravity 1012, alkaline, no blood or casts; albumin, a trace. There was a sediment on standing and the urine contained a large quantity of pus. Re-examination: Pelvis of right kidney contained many calculi. There were two stones in the left kidney.

The patient, after a week's treatment, considerably improved; the temperature fell to normal, and the amount of pus in the urine considerably decreased.

Operation.—Right pyelo-lithotomy and removal of 23 calculi on August 15th. Under chloroform and ether the kidney was exposed by a right lumbar incision, 5 inches in length, separated from the surrounding perinephric tissue, and delivered through the incision without difficulty. The pelvis of the kidney was much dilated; it was incised and three large and 20 small calculi were removed. They were faceted and irregular in shape, the three large ones having a deposit of phosphates upon them. The total weight of the 23 was ¾ oz. A considerable part of the kidney tissue had been destroyed, but a fair amount of secreting tissue remained. A catheter was passed through the pelvis of the kidney and so into the ureter and bladder. There was no obstruction, the catheter was removed, and the incision in the pelvis closed. The lumbar incision was closed, with drainage. The patient made a good recovery. The lumbar wound healed in four weeks, and the patient was sent to a convalescent home.

Second Admission to Hospital.—The patient was again admitted on Dec. 3rd, 1921. Her general condition had much improved; she had increased in weight and had no pain since her discharge from hospital. On examination, the right kidney was only just palpable; no pain in right loin. Urine: Specific gravity 1010, acid; albumin, a trace; small amount of pus still present. X ray examination: no stone now present in right kidney; two stones in left kidney.

Operation.—On the 9th, left lumbar nephrolithotomy, two stones were removed; they were similar in substance to those removed from the right kidney, and weighed ¾ oz. together. The wound was closed with drainage, and the patient made a good recovery from the operation, the wound being quite healed three weeks after the operation.

CASE 2.—Male, aged 36, admitted to the Norfolk and Norwich Hospital on August 7th, 1921, complaining of dull aching pain in both loins.

History.—Patient stated that in 1914 he began to notice dull aching pain in both loins. In October of that year he was admitted to a Naval Hospital after passing a small quantity of blood in the urine. He was X rayed, and calculi were found in both kidneys. He was discharged from the Service without operation. During the past five years he had suffered with occasional attacks of pain in the loins. The attacks of pain had got more frequent of late and he had never felt quite well.

Condition on Admission.—The patient was a healthy-looking, well-developed man. Temperature 98° F., pulse 80, respirations 18. Eyes reacted to light and accommodation, Cranial nerves normal, tongue clean, tonsils not enlarged, no palpable lympathic glands in neck. Chest: heart and lungs normal. Abdomen: abdominal wall muscular and well developed, moved well and equally on respiration, abdomen not distended. There is tenderness on palpation over both kidneys, especially the left, the lower pole of which is palpable. The liver is not enlarged, no tenderness over the appendix. Upper and lower extremities normal. Urine: quantity, two pints in 24 hours; reaction acid; specific gravity, 1014; albumin, a trace. No blood. A few pus cells present on microscopic examination. X ray examination: A large stone in pelvis of right kidney, a small stone in pelvis of left kidney. Cystoscopic examination: urine could be seen coming from the right ureteral orifice, but none from the left. It was concluded that the upper end of the left ureter was blocked by a stone. Operation advised.

Operation.—On August 22nd a left pyelo-lithotomy. Left kidney exposed through a left lumbar incision, separated from the surrounding tissues and drawn out of the wound; a calculus could be felt in the pelvis of the kidney and upper part of the ureter. The kidney was turned forwards and upwards so as to expose the posterior aspect of the pelvis. An incision was made into the posterior aspect and a stone extracted without difficulty. The ureter was then explored by passing a catheter from its exposed upper end into the bladder. There was no obstruction. The incision in the pelvis was then sutured, and the kidney returned into its bed. The lumbar wound was closed with drainage. The wound healed in the course of three weeks and there was no discharge of urine from the loin. The patient was discharged from hospital a month after operation.

Second Admission to Hospital.—The patient was again admitted in October, 1921; on Oct. 30th, the right kidney was explored and two large stones were removed from the pelvis and cortex of kidney. The ureter was examined and no obstruction was found; the wound was closed with drainage and the patient made a good recovery. The stones consisted of phosphates. Two branched, faceted stones were removed from the right kidney, together weighing 1¼ oz. One beak-shaped stone removed from the left kidney and ureter, weight ¼ oz.

CASE 3.—A male, aged 46, a sailor, was admitted to hospital on Oct. 10th, 1918, complaining of pain in left loin and occasional passage of blood with the urine.

is rarely above the umbilicus—the head is above the umbilical level, the back below it. Only in those cases where the child's head is under the costal margin—i.e., towards full term with a large child—does one hear it best at the umbilical level or above it. In posterior positions the heart sounds are conducted indirectly, and may not be best heard at the point nearest the heart.

DIAPLYTE TUBERCULIN.

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The arrival among us of a new tuberculin—for Dreyer's antigen is no less than this, though we may hope it will prove more—again brings into prominence the important subject of dosage and administration of these substances, powerful for harm as well as good, and necessarily given at the start in doses almost immeasurably small. Tuberculin, especially in the treatment of pulmonary tuberculosis, has fallen into practical disuse in this country during the past ten years, and I find but few of the younger physicians among us have had experience of its administration. Our pathologists, moreover, though well versed in the small infrequent dosage suitable to the treatment of localised tuberculosis, have for the most part ignored the method of frequent and rising dosage accepted all the world over as applicable to the treatment of pulmonary and other forms of autotoxic tuberculosis. Under these circumstances I am tempted to restate some of the essentials of safe administration under the latter method, especially with a view to the avoidance of unexpected large reactions which may vitiate the success of the method and imperil the recovery of the patient. I shall speak only of dosage and of method of administration.

Preparation of Antigen.

The preparation of the antigen for injection demands (1) a diluent, in this case sterilised normal saline containing 0·15 per cent. formalin; (2) an accurate tuberculin syringe graduated in 1/10, the barrel for accuracy being about 8 cm. long (syringes of the Record type are the best); (3) a long 10 c.cm. graduated measure or pipette; and (4) some 10 c.cm. stoppered bottles. 1 c.cm. of the "original solution" (in this case Dreyer's antigen) with 9 c.cm. of the diluent now makes dilution 1, whose bottle is so numbered; 1 c.cm. out of this bottle (dil. 1) with 9 c.cm. of diluent now forms dil. 2; and 1 c.cm. of dil. 2 with 9 c.cm. of diluent makes dil. 3, and so on, each dilution being 1/10 strength of the one above. Now it is obvious that 1 c.cm. of dil. 1=0·1 c.cm., 1 c.cm. of dil. 2=0·01 c.cm., and 1 c.cm. of dil. 3=0·001 c.cm. of "original solution," and so on. This is to state the dose in fluid measure, which is now always done for convenience, and also for avoidance of misunderstanding (since Koch often spoke of milligrammes when he meant cubic millimetres, and, moreover, discussion arose as to the solid contents of T.R., which was made from 10 mg. of tubercle bacilli per c.cm., but found to contain whenever completed only 2 mg. of solid substance (Wright; Ruppel)). If it is demanded, for Dreyer's antigen, that a dose be stated in mg. of solid substance, then this is easily arrived at by dividing the dose in c.cm. by 5 (since 1 c.cm. contains 0·2 mg. of antigen). Thus 1 c.cm. of dil. 3 contains 0·001 c.cm. of original solution, or 0·0002 mg. of solid antigen, and 1 division (1/10 c.cm.) of syringe 1/10 of this, or 0·000 02 mg.

Now when we come to the matter of initial dosage we find that Dreyer's antigen is weaker than any of the tuberculins in common use—it may, perhaps, for convenience be considered to be 1/10 strength of T.R., the weakest of the older tuberculins whose initial dose could be safely put at 0·001 c.mm., or 0·000 001 c.cm.—i.e., 1 division (1/10 c.cm.) of dil. 5. With Dreyer's antigen it should be safe, even in febrile cases, to commence with a dose 10 times this strength—i.e., 1 division (1/10 c.cm.) of dil. 4. In afebrile cases a dose of 2½ or 5 divisions (¼ or ½ c.cm.) of dil. 4 should be safe, this latter representing 1/100 000 mg. of the solid antigen.

Dosage.

So much for dose nomenclature, which need, fortunately, no more be bothered with once the initial dose is decided on. After that the dosage runs up in divisions of the 1 c.cm. syringe from one diluent to the next, from dil. 4 to dil. 3, to dil. 2, and so on. It is, in especial, of the method of graduating this rising dosage that I wish most emphatically to speak. It is here that danger to the patient arises, since avoidance of unexpected reactions (I shall say nothing here of reactions deliberately forced!) depends very closely on the smoothness of this upward gradient of dosage. Now it is obvious that if we rise in divisions of the syringe 1, 2, 3, 4, 5, 6, 7, 8, 9, that is in arithmetic progression, that the rise from 1 to 2 is doubling while the rise from 8 to 9 is but an increase of 1/8—the rise 1 to 2 is a "cliff" in dosage at which a "reaction" is likely to occur. Tuberculin administrators have got over this difficulty by making such a sequence as 1, 1·5, 2, 3, 5, 7, 10, 15, &c., but this is, after all, but a rough and ready device which meets the need but partially. It does not really do away with "cliffs," and it condemns us to a rapidity of rise which may not suit the particular case under treatment. We require, not only a smooth rise, but a rise whose steepness we can modify to meet the individual case. The only logical way to achieve these two ends is by the use of a table where doses rise in geometrical progression, always by the same multiple, however small, and where many different gradients are provided to choose from. Such a table was prepared for Lawrason Brown in the past, and a modification of it, made by Egbert Morland for a *book on Tuberculin Treatment* in which he and I collaborated,[1] is here in part reproduced. In this table the numbers refer to divisions of the 1 c.cm. tuberculin syringe (which must be divided in 1/10). Since no more than 1 c.cm. can be given with this syringe no mistake can be made with these numbers, and the decimal point may be put in or omitted as desired. Having ascended a column of dosage on one dilution, we pass to the next stronger dilution and work up it on the same basis, 1 division (1/10 c.cm.) of the new, stronger dilution being equal to 1 c.cm. of that we are leaving.

10·0	10·0	10·0	10·0	10·0	10·0	10·0	10·0
					7·9	8·3	8·6
				7·5			7·4
			6·8			6·8	
		6·3			6·3		6·3
	5·6			5·6		5·6	5·4
					5·0		
4·6			4·6			4·6	4·65
				4·2			
		4·0			4·0	3·8	4·0
							3·4
	3·2		3·2	3·2	3·2	3·2	
						2·65	2·9
		2·5		2·4	2·5		2·5
2·2			2·2			2·2	2·15
					2·0		
	1·8			1·8		1·8	1·85
		1·6	1·5		1·6	1·5	1·6
				1·3			1·4
					1·3	1·2	1·2
1·0	1·0	1·0	1·0	1·0	1·0	1·0	1·0
3	4	5	6	8	10	12	15

With such a table the initial dose, generally much below the patient's reaction point, may be rapidly pushed up, on a basis of 3 or 4 doses to each dilution or by doubling (a convenient plan), till it begins to be

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[1] Tuberculin Treatment. London: Oxford Medical Publications. *Second edition.* 1913.

History.—The patient stated that in 1902 a stone was removed from the left kidney. He remained in good health until about 1917, when he began to suffer with attacks of pain in the left loin, the pain being referred to the groin. After a severe attack of pain he would occasionally pass a little blood in the urine. He served in the Navy from 1914 until October, 1918, when he was admitted to hospital.

Condition on Admission.—A fairly healthy-looking man. Temperature 98° F., pulse 88, respirations 20. Cranial nerve normal, tongue clean, heart and lungs normal. Abdomen: moved well and equally on respiration, no distension, tenderness on palpation over both loins, but the kidneys could not be felt; liver not enlarged; a scar in the left loin, the result of a previous operation. Urine: specific gravity 1016, acid; no albumin, no sugar. On microscopic examination a few red blood cells present. X ray examination: A stone in each kidney.

Operations.—On Nov. 14th left lumbar pyelo-lithotomy was performed and a large, single, flattened stone removed from the pelvis of left kidney. The pelvis was sutured and the wound closed with drainage. There was no escape of urine through the loin, and the wound healed by primary union. On Jan. 9th a similar operation was performed on the right side and a single stone was removed from the pelvis of the right kidney. The patient made an excellent recovery from the operation. An X ray examination was made after the operation and no sign of stones was to be seen; but stones recurred in both kidneys and the latter were again explored in 1920, stones being removed from the pelvis of each kidney. The patient made a good recovery after each operation.

Remarks.

Sir John Bland-Sutton in his recent selected essays remarks, "The fate of patients who have stones removed from one or both kidneys is an important matter, and one on which little has been written." Among points for consideration in cases of bilateral renal calculi perhaps the most important are: (1) Do the symptoms and physical signs indicate operative treatment? (2) If operative treatment is indicated shall both kidneys be operated upon at the same time or shall one be operated upon before the other? (3) By what method shall the calculi be removed from the kidney? Operative treatment must not be considered necessary simply because X ray investigation shows calculi in the kidneys; the position of the calculi, their size and shape, the symptoms and physical signs to which they give rise, should all be taken into consideration. The three cases described illustrate some interesting features of the disease. Renal calculus may be one of the most chronic surgical diseases, but complications such as renal colic, infection of the urinary tract, and calculous anuria—the gravest and most fatal of all urinary calamities—may occur at any time and almost without warning. Although the ordinary text-books on surgery do not seem to urge operations on cases of bilateral renal calculi, it would seem well to perform it as early as possible in suitable cases where complications seem likely to occur to prevent excessive damage to the kidney taking place from the pressure of the stone, and to prevent the possibility of calculous anuria. The operation, if done at the proper time and in the proper way to avoid complication, and not because of their development, should have a very low mortality.

When operative treatment is indicated, most surgeons consider it best to operate on one kidney at a time, allowing a reasonable interval to elapse before the other operation, but some have advocated operating on both kidneys at the same time; if, however, the only reason for operating on both kidneys at one time is the desire to avoid a second operation, it does not seem to me to be sufficient. When the kidney has been exposed, the importance of determining the correct procedure for the investigation of the kidney and for the relief of the condition present cannot be over-estimated. Sometimes it is not easy to locate the stone; in such a case it is always wise only to do nephrolithotomy or splitting of the kidney as a last resort. This procedure is rarely necessary. Nearly all stones can be located and removed by the performance of pyelotomy and pyelolithotomy combined with the operation that may be described as restricted nephrolithotomy—that is, the making of a small incision through the cortex of the kidney and removing a stone through this small incision. In some complicated cases it may be necessary to remove the kidney.

The length of time during which patients may suffer from renal calculus is noteworthy; in these three cases the condition had in every case been present for more than five years, and in one case over 20 years. In this, as in other surgical diseases, it is often the complications that bring the patient under observation. The disease itself may be present for a considerable time without causing any symptoms.

In bilateral renal calculus it would seem that it is common for the patient to refer the symptoms to the side only, and it would often be impossible to make a diagnosis without the assistance of the X ray. Each case illustrates the importance of X raying the entire urinary tract when a stone has been found in any part of it. It has been recorded that the first successful skiagram of renal calculus was taken by J. McIntyre, of Glasgow, in 1896. When it is realised that 50 per cent. of the patients sent to the radiographer with the diagnosis ? renal calculus are returned as negative, it at once becomes apparent what an important factor the X ray has in the diagnosis. It is almost impossible to diagnose bilateral stone without the aid of X ray. The cystoscope is of additional use in deciding on which kidney to operate, and gives definite information as to the obstruction to the ureter. It is uncommon to be able to palpate renal stones, but in one of the cases recorded this could be done without any difficulty. Similar cases have been recorded by Pick and Morris.

Bilateral renal calculi are not uncommon, but not many records of the treatment of such cases are to be found in the literature. Kummel, in 101 consecutive cases of renal calculi, found both kidneys involved in 16 cases. Bevan states that the proportion of bilateral cases numbers about 20 per cent. Küster, in 764 cases of stone, found 90 bilateral; he collected 20 cases in which double operations were performed and found ten successful cases, three recovered with fistula, and seven died, the deaths being due in most cases to uræmia. Simpson, of Liverpool, has recorded an interesting case of bilateral nephrolithotomy for multiple calculi in a boy aged 8; in his paper he mentions some details of the history of the operation for removal of stones from the kidney. He records that the operation is said to have been performed in the time of Hippocrates, but not again for many centuries after that time. In 1579 it is recorded that Paré operated upon an archer reprieved from death, but it is not stated that the stone was removed.

In 1696 Marchette, of Padua, is said to have extracted a stone from the right kidney of the English consul at Vienna, and in 1773 Paul, of Stroud, is believed to have removed a stone from the back of a woman and effected a cure. The discovery of anæsthetic and antiseptic soon made the removal of stones from the kidney an operation which might be undertaken with some hope of success. In 1869 Thomas Smith described the operation and Dawson, of Ohio, tried it in 1872, but the patient died. At St. Bartholomew's Hospital Callender, in 1873, and Morrant Baker, in 1874, attempted the operation, but both patients died. In 1876 Savory, guided by a sinus, tried it again and cured his patient. In 1878 Teale operated upon an unsuccessful case, and in 1880 Morris successfully recovered a stone from the kidney. From that time onwards the operations on the kidney have been numerous and successful.

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DUODENAL DIVERTICULA.

WITH REPORT OF A CASE OF GANGRENOUS DIVERTICULITIS.

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HISTORICALLY our knowledge of duodenal diverticula can be divided into three stages. (*a*) A long period of just over 200 years from 1710 to 1912; during this period these pouches were recognised as being occasionally present, and gradually their macroscopic and microscopic appearances were described. (*b*) A short period from 1912 to 1922; in these ten years it was shown that the condition could sometimes be discovered in the living subject by means of the X rays. (*c*) The third stage—that of the description of pathological conditions of these pouches and the resulting symptoms; this has largely followed on and depended upon the work of the radiologist.

In 1710 Chomel[1] discovered post mortem in the body of a female, aged 80, who had died of apoplexy, a pouch connected with the duodenum, which contained 22 stones of a yellow-white colour, with polished surfaces and solid but not stony hard consistency. He then described the symptoms from which she suffered: "La dame qui portoit ces pierres ne vomissoit point; mais deux heures après qu'elle avoit mangé elle sentoit une legere douleur vers l'endroit où le sac étoit placé. C'étoit-là justement le temps où le chile de la nouvelle digestion couloit dans le duodénum, qui ne lui donnoit pas un passage assés libre, parcequ'il étoit comprimé et gesné par le sac." From this description it is doubtful whether the pouch would correspond with an ordinary duodenal diverticulum.

In 1761 followed Morgagni's[2] description, "in the body of an apoplectic man—a diverticulum connected with the duodenum about 2 inches below the pylorus, which was a kind of cellule not very protuberating, but big enough to admit a finger, with no trace of present or past ulceration." The first description in this country was by Habershon[3] in 1857, who said, "diverticula have been noticed but are exceedingly rare as compared with those arising from the lower part of the ileum; these pouches in the duodenum consist generally of mucous membrane and might be considered as a form of hernial protrusion of that membrane." From this time onwards pouches were described by various authors, and in 1893 Perry and Shaw[4] discussed 14 cases, dividing the pouches into two types—(i.) those in which the surrounding intestine was apparently normal, and (ii.) those in which the pouch was the result of ulceration or traction. They also discussed the age incidence, sex, site, and the fact that the pouches are occasionally multiple. Keith also in 1903 and 1910[13] increased our knowledge of this subject. The result of these various descriptions was that in 1911 Buschi of Bologna[5] was able to summarise 54 cases.

In 1912 Bauer[6] mentioned a case in which a pouch was thought to have caused pyloric obstruction; operative treatment (gastro-jejunostomy) was carried out, but the patient died on the eleventh day. The first pouch said to have been removed surgically was reported in 1914 by Forssell and Key, quoted by Case,[14] in a female of 41; the condition was discovered by means of X rays and removal yielded a cure of persistent digestive complaints. In 1917 Ritchie and McWhorter[7] found 76 cases in the literature with 87 diverticula, together with 11 cases with 12 diverticula published by radiologists. The radiological aspect was developed largely by Cole, Case,[14] and in this country by Spriggs.[8]

Causation.

There has been much discussion as to the manner in which these pouches are produced, and various theories have been advanced. The following ætiological factors have to be considered: (1) Whether these diverticula are congenital or acquired; (2) if acquired, whether of the traction or pressure type.

$$\text{Diverticula}\begin{cases}\text{Congenital (true)*}\\ \text{Acquired (usually false)}\begin{cases}\text{Traction}\\ \text{Pressure}\begin{cases}\text{Weakness of wall.}\\ \text{Pressure within.}\end{cases}\end{cases}\end{cases}$$

* i.e., composed of all layers of the bowel wall.

It will be seen from the following that these duodenal diverticula are of various types, into whose formation the above factors enter.

Congenital Diverticula.

Many observers regard duodenal diverticula as being of congenital origin, and have advanced the following points to support this theory:—

(1) The duodenum gives off the pancreatic and biliary buds and so is regarded as being a likely site from which, owing to excessive activity, other similar buds might be extruded; but it is to be noted that diverticula are also common in the colon, especially the lower colon, where there are no such organs as the liver and pancreas developed, whereas in the region of the cæcum and ascending colon, where there is a bud (the appendix), these diverticula are rare.

(2) The presence of portions of pancreatic tissue in the wall. This, however, could be accounted for otherwise, as the presence of such islands of pancreas in the muscular wall of the duodenum would leave a weak area from which during life a pouch might be developed.

(3) The absence in the majority of cases of any pathological condition—e.g., ulcers, adhesions, &c. This is certainly the case, but a pathological condition is by no means essential to the production of a pressure pouch.

(4) A case of Shaw's[9] in which, in association with atresia of the duodenum, there was a congenital sac. This shows the undoubted *possibility* of these pouches being congenital in origin, but here there was atresia of the duodenum, and so the condition was far from representative; moreover, the pouch was shallow and arose from the first part of the duodenum, a rare position.

(5) Buschi[5] observes that on account of the fluid nature of the duodenal contents the stasis would have to be of a high grade to produce pouches. It would seem, however, that the pressure exerted by fluid, even if slight, might start a pouch at some weak site, and once formed the condition would be progressive.

(6) In Ritchie and McWhorter's case[7] the history goes back to childhood and so suggests a congenital origin. This does not appear to be a very forcible argument, as a history of digestive disturbance cannot be definitely assigned to the presence of such a pouch.

(7) The presence of associated abnormalities—e.g., œsophageal pouches, bladder pouches, &c.

(8) Lewis and Thyng[10] showed the presence of intestinal diverticula in embryos of the pig, rabbit, and man.

(9) The fact that the diverticulum may be composed of all layers of the normal duodenum. This is, however, uncommon—an example is afforded by a case recorded by Murchison[11] and the case is reported below.

The conclusion may then be drawn that congenital pouches may occur, but they probably only form a small percentage of duodenal diverticula. Evidence in favour of an acquired origin of these pouches is as follows:—

(*a*) Anatomically, the pouches usually arise from weak areas of the wall—e.g., the retro-peritoneal aspect, and where the musculature is weakened by the passage of the pancreatic and biliary ducts or by blood vessels. In a case reported by Dorrance[12] the opening was situated 3·5 cm. below the papilla, but in this case there was a large artery and vein situated in the wall.

(*b*) Histologically, as will be shown below, in the majority of cases reported the structure of the wall was that of a false diverticulum—i.e., not composed of all layers of the duodenal wall.

(*c*) Clinically and radiologically, these pouches have usually been discovered in old subjects, and very rarely described in the young.

(*d*) Experimentally, it has been found that if produced artificially the rupture occurred regularly in the retro-peritoneal aspect. Too much weight cannot, however, be attributed to this, as other workers have failed to confirm this observation.

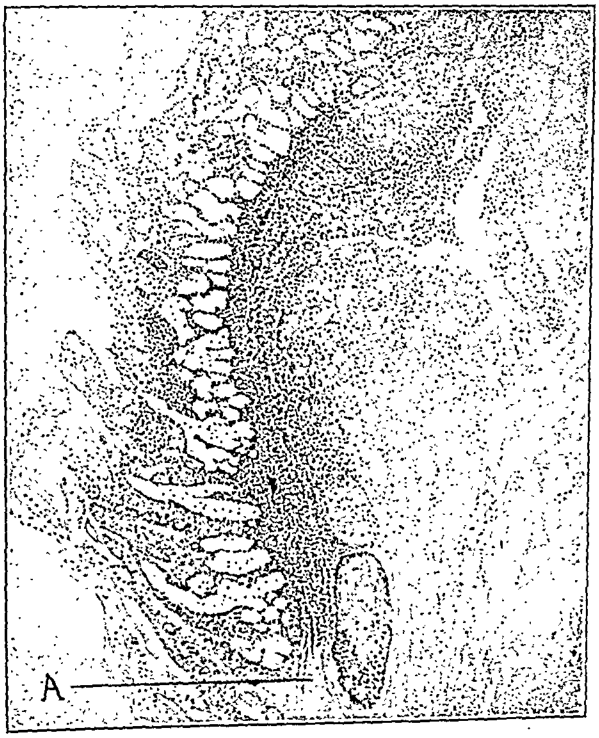
(*e*) By analogy, colonic diverticula arise at the site of penetration of the muscular coat by blood vessels.

(*f*) Some are definitely of an acquired origin and due to traction, but these form a small proportion. The traction may be due to adhesions from gall-bladder disease, or, some authors say, to an atrophic pancreatitis; more probably, however, in this latter case the pancreatitis is secondary to the presence of the diverticulum. It is improbable that the pancreas causes traction pouches, because (1) there are many cases of pancreatitis without diverticula, (2) the pouches are usually easily separated from the pancreas. Keith[13] says traction pouches may be produced in association with visceroptosis, by a prolapsed condition of the duodenum resulting in dragging by the common bile duct.

In the London Hospital in March, 1922, a case under the care of, and operated upon by, Mr. A. J. Walton afforded rather an unusual example of a traction pouch, occurring, however, in the first part of the duodenum.

A married woman, aged 38, admitted on March 6th, 1922. The pre-operative diagnosis was lesser curve ulcer—pyloric obstruction, visceroptosis. On the 7th a barium meal examination was made by Dr. M. H. Jupe, who reported "Bilocular stomach with penetrating ulcer of the lesser curve; gastroptosis and a peculiar condition of the duodenum, so that it appeared to pass transversely to the left to the region of the ulcer." Operation was performed on the 8th: partial gastrectomy, removal of first stage duodenum, appendicectomy. There was an ulcer of the lesser curve adherent to the pancreas and with hour-glass constriction of the stomach; in the duodenum there was a pouch, ¾ in. × 1½ in., adherent to the lesser curve ulcer.

FIG. 1.—*Section of Apex of Inflamed True Diverticulum of Duodenum (case reported below).*



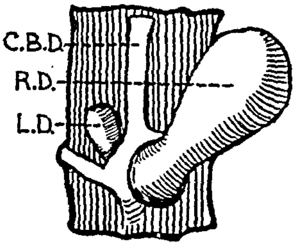
Shows partly necrosed mucosa and submucosa. That the diverticulum is true is shown by the presence of remnants of the muscular coat close to Brunner's glands at the point marked A. The muscularis mucosæ, which should lie superficial to Brunner's glands, cannot be recognised. There is great congestion of vessels and hæmorrhage with acute inflammatory infiltration.

Description of Pouches.

Duodenal pouches may arise from any of the three portions into which the duodenum is anatomically divided. The great majority are found in the second portion of this segment of the intestine and particularly on the postero-internal aspect, in close relation to the ampulla of Vater, so that diverticula at this particular site have been termed by the French "diverticules périvatériens" (Letulle). Spriggs[8] analysed the position of the neck of the sac in 57 cases and obtained the following figures: First part, 11; second part, 41; third part, 3; first and second parts, 2. This, however, probably gives rather a high proportion for those situated in the first part, as he quotes his own ten cases, none of which were in the first part; also Ritchie and McWhorter[7] in their 97 diverticula found only eight in the first stage.

From its duodenal origin the pouch may extend in any direction, but by far the most common is inwards towards the concavity of the duodenum, where it comes into close relationship with the pancreas, from which, however, as a rule it separates readily. Extending in this direction and originating in the region of the ampulla the diverticulum must of necessity be intimately related to the bile duct, which, as a rule, lies on the posterior or lateral wall, but the pouch may be actually constricted or rendered bifid by the common bile duct (Fig. 2); occasionally the bile passage opens on the fundus of the sac.

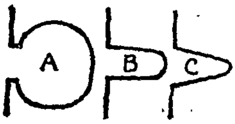
FIG. 2.



Relationship of diverticula to common bile duct (after Sir A. Keith.)

C.B.D.=Common bile duct.
R.D.=Right diverticulum.
L.D.=Left diverticulum.

FIG. 3.



Shapes of diverticula.

A, Flask-shaped. B, Cylindrical. C, Conical.

In size there is considerable variation, ranging from the size of a pea to that of a hen's egg, but most commonly of an intermediate size, about that of a walnut. At its duodenal opening the mouth of the pouch is usually comparatively wide and will usually admit the little finger, and may be still wider; from this origin the pouch extends outwards and may be flask shaped, cylindrical, or conical (Fig. 3).

The sac may be empty, and when exposed at operation becomes distended with gas. Instead of being empty, however, it may contain clear mucoid fluid, chyme, and (rarely) biliary sediment and bile-stained fluid, as in a post-mortem example recorded by Bassett,[14] in which the bile papilla opened at the lower lateral edge of the aperture of the pouch.

In structure the wall is thin; on microscopic examination, if the pouch is of the true type, it will be composed of all the layers of the duodenum, and the mucosa will show crypts of Lieberkuhn and Brunner's glands (Murchison's case[11]). More commonly, however, the diverticula are of the false type and composed of a mucosa, from which Brunner's glands are usually absent; the muscularis usually forms a well-defined ring at the base, but is deficient over the remainder of the sac, though sometimes a few fibres may be traced for a variable distance over the sac from the neck; occasionally a few atrophic fibres of the muscular coat cover the whole sac. Portions of pancreatic tissue may be found.

Frequency.—These diverticula are undoubtedly much more common than was formerly realised, and probably occur in from 1 to 2 per cent. of human subjects. Baldwin[15], 1911, found 15 diverticula in 115 cadavera. Linsmayer,[16] 1914, found 45 diverticula in 1367 autopsies (3·4 per cent.). Case[17] found 85 diverticula in 6847 X ray examinations (1·2 per cent.). Wyllys Andrews[18] found 26 deformities in 2200 X ray examinations (1·2 per cent.). Spriggs[8] found 10 diverticula in over 1000 X ray examinations. In about one-fifth of the cases the diverticula are multiple and there may be as many as five present.

Age.—Diverticula may be found at all ages from birth onwards, but much more commonly in old subjects; according to Buschi[6] 80 per cent. occur after the age of 50 years.

Pathological Conditions Superimposed upon Diverticula.

Although duodenal diverticula are much more frequently present than was formerly imagined, yet pathological conditions of these pouches are extremely rare, either in the living subject or at necropsy. This fact is, undoubtedly, due to two factors—(*a*) the sterility of the duodenal contents, and (*b*) the fact that there is little tendency to stagnation on account of the wide opening into the duodenum and the fluid nature of the contents. Infection plus stagnation are the two great factors in causing inflammation of diverticula, as exemplified in the appendix and again in colonic diverticula. The rate of emptying of duodenal diverticula varies, and, as most frequently there is no musculature in the pouch wall, must of necessity depend largely on mechanical factors, and so be influenced by the part of the duodenum from which the sac originates and the direction it takes. Case,[17] from X ray observations, states that the opening of the pouch is usually so large that barium leaves almost as rapidly as it enters. In a case reported by Basch[19] and operated upon by Elsberg, the pouch was dependent from the junction of the second and third portions of the duodenum, and bismuth retention occurred at the end of 96 hours; this case had associated symptoms.

The pathological conditions which may be found are: (*a*) Of the diverticulum itself, acute or chronic inflammation. (*b*) Results of the spread of inflammation, chronic duodenal catarrh, pancreatitis. (*c*) Mechanical results: interference with the passage of intestinal contents giving rise to duodenal dilatation; obstruction of the biliary and pancreatic ducts. (*d*) Pathological conditions, giving rise to the formation of the diverticulum.

Acute Inflammations.—These are rare. Bassett[14] recorded a condition discovered post mortem of a pouch filled with blood-stained fluid; microscopically the changes were those of a hæmorrhagic inflammation and there was an associated localised pancreatitis. In 1919 Akerlund[20] reported a case in which the sac contained a mass of necrotic pancreatic tissue, which had resulted from extension of the diverticulitis. Below is reported a case, admitted as an emergency, in which there was an acute inflammation of a thin-walled friable sac with the mucosa entirely gangrenous.

Chronic Inflammations.—These are considered to be of more frequent occurrence; a number of cases have been published in which the symptoms have been attributed to this condition, but as to how far these symptoms are actually due to these diverticula or to other associated conditions it is difficult to judge at present, as the pathological state has not usually been mentioned, any post mortem description being mainly concerned with determining whether the diverticulum is true or false.

Results of Spread of Inflammation.

Wilkie[21] in two of his three cases considered that stagnation may have led to chronic duodenal catarrh; one of these cases, in which there were associated folds in the duodenum, died of hæmorrhagic pancreatitis, the other had a number of associated pathological conditions—viz., duodenal ulcer, cirrhosis of the liver, cholecystitis, and gall-stones. Inflammation spreading from the diverticulum may involve the closely surrounding pancreas and give rise to a localised condition of chronic pancreatitis with resulting adhesions between the sac and the pancreas. An example of such a condition is afforded in a female patient of Case's,[17] aged 45, who complained of pain in the lower dorsal region. X ray showed a diverticulum in which the food was retained a little longer than it took the stomach to empty. At operation a diverticulum was found 5 cm. above the duodeno-jejunal flexure; it was not removed because of close adhesions to the pancreas; appendicectomy and cholecystectomy were performed.

Mechanical Results.—(*a*) Interference with the passage of intestinal contents. Bauer[6] reported a case in which a large diverticulum of the second portion of the duodenum was thought to have pulled on the pylorus and to have caused persistent vomiting and emaciation; gastro-jejunostomy was performed but failed to stop the vomiting, and death occurred on the eleventh day. Post mortem there was dilatation of the stomach and of the duodenum above the site of the pouch. Similarly, in the case reported by Basch,[19] and operated upon by Elsberg, there was a dilatation of the duodenum above the diverticulum.

(*b*) Obstruction to the biliary and pancreatic ducts. Many of the cases of diverticula are associated with disease of the biliary tract and pancreatitis, as in the case of Wilkie's[21] above mentioned with associated gall-stones. This may be due to a mechanical obstruction of the ducts, or, as suggested by Akerlund,[20] due to a catarrhal inflammation giving rise to swelling and secondary dilatation of the ampulla of Vater, with insufficiency of the sphincter and so a pancreatitis.

(*c*) Pathological conditions associated. These may be either causative of the pouch—e.g., gall-bladder disease, duodenal ulcers, &c.—or merely accidentally associated.

Symptoms and Signs.

As a rule these pouches give rise to no symptoms, because there are rarely any pathological lesions of the diverticula. In cases of acute diverticulitis, as in the case reported below, the symptoms are the same as those of an acute inflammation of any diverticulum, and so will simulate appendicitis in association with an undescended cæcum, and the signs will correspond. In those cases in which the condition is not acute the symptoms will vary and consist of: (*a*) Those of accidentally associated conditions in which the pouch is discovered in the routine X ray examination; (*b*) those due to pathological conditions secondary to the diverticulum—e.g., duodenal obstruction with nausea and vomiting, biliary obstruction, and chronic pancreatitis; (*c*) those due to pathological conditions of the pouch itself. A typical case of this group is one reported by Lewis[22] in a patient who six years previously had an attack of pain two to three hours after meals relieved by the next meal. The condition then subsided, to be followed by a three years' history of pain in the right upper quadrant of the abdomen, radiating to the right shoulder and scapula, this pain coming on two to three times a week. The onset of the pain was gradual, becoming worse during the course of the day and reaching its height at about 5 P.M.; there was occasional nausea and occasional jaundice. Operation showed a diverticulum on the anterior wall of the first stage of the duodenum, and its removal yielded relief of symptoms. Moore[23] also records a case in which the main symptom was pain coming on late after meals, and observes that the pain was worse in the afternoons; this may possibly be due to the pouch filling during the day and emptying during the night.

Other symptoms are nausea, flatulence, "sour stomach," distension, and fullness. It will be seen that such pouches may give symptoms simulating the other surgical dyspepsias—e.g., gall-stones, duodenal ulcer, &c.

Treatment.

As a rule treatment is not required because of the lack of symptoms. On the other hand, if these diverticula are discovered during a barium meal examination of a patient, who is complaining of abdominal symptoms, their removal is indicated. If possible, X ray localisation should be careful and accurate, as otherwise great difficulty may be encountered in finding a retro-peritoneal pouch at operation. The treatment is—(1) invagination of the diverticulum if small, or (2) excision if too large for this form of treatment. On account of narrowing of the lumen of the bowel as a result of excision it may be necessary to combine with the above a gastro-jejunostomy, or, if the pouch is of the third portion of the duodenum, a duodeno-jejunostomy. Occasionally the diverticulum may arise from the first stage of the duodenum and be combined with a pyloric ulcer, as in Murchison's case,[11]

when the pylorus and the first portion of the duodenum were removed and anastomosis performed. Mr. Walton's case quoted above affords a similar example.

Case Record.—Married woman aged 27; occupation, household duties.

Past History.—Influenza. No history of indigestion of any description.

Present Illness.—Onset March 20th, 1923, at 1 P.M. Abdominal pain in epigastric region, of a dragging character and giving rise to a feeling of nausea. Later the pain settled in right hypochondrium. Vomited four times.

Progress.—On the 21st, at 3 A.M., pain became worse and persisted until 8 A.M., when it lessened somewhat. Bowels regular; micturition not affected.

Condition on Admission.—Thin woman with a sallow complexion. Temperature 101·3° F., pulse 108 per minute. Abdomen: Marked tenderness and rigidity of the upper half of the right rectus muscle; no palpable tumour; muscles of lower right abdomen flaccid. Hyperæsthesia nil. Urine, heart, lungs, and nervous system, nothing abnormal discovered.

Pre-operative Diagnosis.—Acute inflammation of a vermiform appendix situated under the liver.

Operation.—At 9.45 P.M. on the 21st, under general anæsthesia (A.C.E. and ether), by Mr. W. Thomas. No tumour palpable. Right paramedian incision 4 in. in length, extending upwards from the umbilicus. The cæcum came up freely into the wound and the appendix appeared normal. The appendix was removed. A flake of lymph was observed to come down from the right upper abdomen. On prolongation of incision upwards, the stomach, gall-bladder, and first stage of duodenum were found to be normal. In the area between the duodenum and the gall-bladder and situated on the posterior abdominal wall was a lump, surrounded by an area of infiltration and œdema, and situated in front of the kidney, which could be moved behind it. The gastro-colic omentum was opened and the pancreas found to be apparently normal. An incision was made through the posterior peritoneum above and to the outer side of the duodenum; it was then possible to separate out a pouch from the retroperitoneal tissues. This pouch had a diameter of 1 in., and was thin-walled and black in its centre. (Fig. 1 shows a section of the apex of this diverticulum.) The mucosa was black; the pouch was empty except for a small amount of friable golden-yellow debris; in the lower portion there was a communication into the duodenum in the region of the ampulla of Vater which would admit the little finger. The diverticulum was not connected with the bile ducts. It was cut away, the neck being sutured with a running catgut suture; an endeavour being made to put in a second invaginating suture, bleeding occurred from the inner portion of the neck, and this suture had to be abandoned and the bleeding controlled. The posterior peritoneum was sutured as best possible, but was extremely friable. Stab drainage laterally. Abdomen closed in layers and with tension sutures.

Progress.—Three days after operation the stab wound started to discharge freely and there was a fistulous communication. On the tenth day the stitches were removed, the laparotomy wound having healed by first intention; discharge from the stab wound was diminishing. On the seventeenth day the discharge had ceased and the stab wound was granulating. Patient was sent to convalescent home on twenty-first day.

In conclusion, my thanks are due to Sir Hugh Rigby and Mr. A. J. Walton for kindly giving me permission to publish their cases.

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FURTHER RESEARCH ON THE RELATION OF CARCINOMA TO INFECTION.

BY W. M. FORD ROBERTSON.

IN a paper by my late father, Dr. William Ford Robertson,[1] read before the Section of Pathology and Bacteriology[2] of the British Medical Association, Newcastle-upon-Tyne, July, 1921, he recorded that certain rods which he had observed within cancer cells were anaerobic bacilli of the diphtheroid group of micro-organisms. Further, he brought forward evidence to show that the continued proliferation of the epithelial cells was due to the action of these bacteria.

As stated in the paper there are, at least, four distinct methods by which the validity of this hypothesis might be tested: 1. Direct microscopic examination of cancer cells. The rods were demonstrated many years ago (THE LANCET, Jan. 28th, 1908) by my father's palladium methyl-violet method; they occur chiefly within the nucleus and the infected cells occur in special areas; throughout the greater part of the tumour it may be impossible to observe any of these rods. 2. Artificial cultivation of the supposed bacteria. The evidence of this kind obtained up to the time at which the paper was published, as pointed out by the author, was, "perhaps not so decisive as that of the other three methods," but was sufficiently striking. He had isolated anaerobic bacilli of the diphtheroid group from eight carcinomata of the breast. It is to fill up this gap in the evidence then put forward that the present research has been undertaken. 3. The experimental production of cancer. Either pure cultures of the anaerobic diphtheroid bacillus, or of cultures of this micro-organism, together with cultures of a staphylococcus obtained from the human cases investigated, were inoculated into mice. Carcinomata were produced in one series of cases, positive results being obtained in all (100 per cent.) of five mice inoculated by the anaerobic diphtheroid bacillus and a mannite non-fermenting staphylococcus obtained from the same human case of adeno-carcinoma of mamma. In this experimental work it was recorded that micro-organisms obtained from a cancerous growth in the human subject produced cancerous growths, primary, in various organs (kidney, pancreas, uterus, &c.) of the different mice inoculated. 4. Focal reaction and therapeutic immunisation. Several cases of human carcinomata were recorded in which definite focal and general reactions occurred after inoculation with a vaccine prepared from the diphtheroid bacillus. Of certain of these cases, after such vaccine treatment, the neoplasms had decreased in size, the pain and discomfort from the growth were greatly diminished. One case of recurrence after operation was treated, the recurrent growths disappeared, and, at the present time of writing (July, 1923), the patient is still alive, active, and able to pursue his occupation, that of a labouring man.

To complete the cultural evidence it was obvious that a modification of the methods employed up to the date of the paper at the end of 1921 was necessary. Dr. Ford Robertson introduced into his technique the de-aeration of pure sheep's serum and, also, of de-aerated hæmoglobin serum glucose agar medium.

Before the value of these media could be tested thoroughly Dr. Ford Robertson was taken ill, and the work was carried on by me. The present paper is a record of this work.

Throughout my investigation I was in constant personal communication with my father, and, as a result of my work, both cultural and therapeutic, he requested me, shortly before he died, to state that he was convinced that the cause of and a cure for cancer

had been discovered. The laboratory findings recorded in the present publication were demonstrated in the Section of Pathology and Bacteriology at the recent annual meeting of the British Medical Association.

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[1] An obituary notice of Dr. W. Ford Robertson appeared in THE LANCET of July 28th.—ED. L.

[2] THE LANCET, 1921, ii., 335; Brit. Med. Jour., 1921, ii., 929.

Preparation of Media.

1. *Preparation of De-Aerated Sheep Serum (D.A.S. Medium).*—For many years Dr. W. Ford Robertson kept a small flock of sheep solely for the purpose of obtaining blood or serum. A large hollow needle having been sterilised in boiling vaseline, the excess of vaseline is shaken out, and the needle is transferred to a sterile test-tube which is plugged. The sheep is placed and secured on a trestle sufficiently high to keep the feet off the ground. The side of the neck is clipped, lathered, and shaved. The wool around the shaved part is soaked with a solution of carbolic acid and the shaved skin cleansed with 1 : 50 (about) carbolic acid. The external jugular vein is made to stand out prominently by pressure applied to the lower end. The large sterile needle is inserted into the vein at its upper end, and the blood is allowed to flow through the needle into 6 in. by 1 in. test-tubes, about 40 c.cm. of blood being collected in each tube. Twelve tubes are taken at each bleeding. The blood is allowed to stand for not more than 24 hours, and then the serum is pipetted or drained off. Any tube in which the serum is cloudy and showing a scum on the surface is discarded (*Bacillus subtilis* is the most frequent contamination found). Some of the tubes occasionally have shown a fatty layer floating on the surface of the serum after 24 hours. This is thick and creamy in character, being quite distinct from the cloud and scum produced by *B. subtilis*. After decanting the serum into sterile test-tubes of ordinary size (5 in. by ½ in.), each of which is half filled, the fatty substance may continue to appear. As many as four centrifugings have had to be done in order to clear the serum. The centrifuged deposits have been microscopically examined and proved to consist of fat globules, all inoculations from these deposits on to hæmoglobin agar, &c., have proved them to be entirely free from micro-organisms. The ordinary tubes are plugged lightly and then transferred to an air-tight bottle attached to a Geryk pump. Air is exhausted until the serum begins to froth, further air being extracted when this frothing has ceased. The process is repeated every 15 minutes throughout the day. The tubes are incubated in vacuo until required for use, a periodical examination being made for the presence of cloud or marked deposit. Any so affected are centrifuged and tested for sterility. If the serum remains clear from the beginning, contamination rarely occurs later if care is taken with the plugging before storage. The presence of the fat, however, may give a little trouble, but this merely requires the serum to be centrifuged and the clear fluid decanted into a fresh sterile tube. In some cases it has been found useful to acidify the de-aerated serum by bubbling CO_2 gas through it for five minutes (D.A.S. + CO_2). When required for use the de-aerated sheep serum is decanted into small tubes measuring 2 in. by ¼ in., which are sealed with corks soaked with boiling paraffin wax.

2. *Preparation of De-Aerated Hæmoglobin Serum Glucose Agar (Glucose Agar + 12).*—After pouring off the serum from the blood in the large tubes as described above, the blood-clot is allowed to stand for a further 48 hours. To produce lysis of the corpuscles the tubes are kept overnight in a freezing mixture of salt and water, after which they are warmed up in a basin of water at 60° C. for 10 minutes. They are then kept 24 hours before decanting into large sterile tubes. The hæmoglobin serum is then de-aerated by the same method as described for de-aeration of the pure serum. Freshly sterilised agar, in a test-tube of ordinary size, is cooled down to about 70° C., and a few drops of the de-aerated hæmoglobin serum are added and mixed. The tubes are sloped and the contents allowed to solidify. A sterile cotton-wool plug, half an inch in length, is pushed down to just above the upper limit of the agar. A small amount of pyrogallic acid is shaken on to the top of the plug, a few drops of sodium hydroxide solution (10 per cent. in water) are added, and the test-tube is sealed by a cork soaked in boiling paraffin wax. The tubes are incubated at 37° C. for 24 hours to test their sterility, and are then stored for use. The glucose agar is made according to the technique given in "Therapeutic Immunisation in Asylum and General Practice," by W. Ford Robertson, Chap. V., "Bacteriological Methods." The acidity of the agar is + 12.

3. *Other Media Used.*—Other media used have been made according to the instructions contained in "Therapeutic Immunisation in Asylum and General Practice" referred to above. In some cases Dorset egg medium has been made with the addition of de-aerated hæmoglobin serum, and has proved a valuable medium in the research. In several instances, to obtain the earlier subcultures, Dorset egg medium was necessary.

Technique for Inoculation of Media.—A small cube of about ½ in. square is cut out with strict aseptic precautions from the deeper margin of a neoplasm removed at operation. Culture must be made not later than 8 to 12 hours after operation. With lymphatic glands containing metastatic growths the whole gland may be used if small enough. The cube removed is cut up into small portions of such size as to be capable of insertion into the 2 in. by ¼ in. test-tubes. (*a*) One of these portions of tissue is pushed down with a sterile glass rod into each of two D.A.S. tubes and into two D.A.S. + CO_2 tubes until it is just below the surface of the medium. The paraffin cork is re-heated and re-inserted. The tubes are then incubated at 37° C. (*b*) The remaining pieces of the tissue are cut up into small fragments and placed in a strong test-tube containing ¼ inch of sterile ground glass. About ½ in. of sterile normal saline solution is added and the whole ground up by a sterile glass rod. A few loopfuls of this solution are used to inoculate the following media: (1) One or two tubes containing "glucose agar + 12" medium and rendered anaerobic by the pyrogallic acid method (see above). (2) One tube containing Dorset egg medium; after inoculation the air is displaced by CO_2 gas and the tube is sealed with a plug of wool soaked in hot paraffin. (3) Instead of tube (4) in some cases Dorset egg medium, to which had been added de-aerated hæmoglobin serum (see above) is used. After inoculation the air is displaced by CO_2. (5) Two tubes containing ordinary hæmoglobin agar + 18. One of the tubes is rendered anaerobic by the pyrogallic method, the other being incubated anaerobically. (6) One tube containing ordinary lactose serum agar incubated aerobically. All these tubes were incubated at 37° C.

Addendum on Technique.—Recently a modification of the cultural technique has been employed which has proved of great use in making early subcultures and in dealing with weekly growing strains of the anaerobic diphtheroid bacillus. This technique was devised to bridge over the gap existing between the fluid D.A.S. and D.A.S. + CO_2 media and the comparatively dry condition of the surface media in the glucose agar + 12 tubes, the transition from one to the other being too sharp. A small amount of D.A.S. was poured into a tube containing glucose agar + 12 medium sufficient to form a layer 1 mm. thick and allowed to collect at the bottom. The surface of the tube was then inoculated with a loopful or more of the deposit. A small sterile plug was next inserted and pushed down a short distance from the upper limit of the medium. On this plug a layer of ⅛ in. finely powdered calcium chloride was dropped, which was covered by another sterile wool plug ½ in. in thickness. On this plug a thin layer of pyrogallic acid was laid, and a few drops of sodium hydroxide (10 per cent. sol.) was added. The mouth of the tube was then sealed with a cork previously soaked in boiling paraffin wax. The tube is now laid flat, so that the serum formed an even layer over the medium, the whole being incubated for 36 hours. After this time the calcium chloride has absorbed all the water from the

when the pylorus and the first portion of the duodenum were removed and anastomosis performed. Mr. Walton's case quoted above affords a similar example.

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Past History.—Influenza. No history of indigestion of any description.

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Condition on Admission.—Thin woman with a sallow complexion. Temperature 101·3° F., pulse 108 per minute. Abdomen: Marked tenderness and rigidity of the upper half of the right rectus muscle; no palpable tumour; muscles of lower right abdomen flaccid. Hyperæsthesia nil. Urine, heart, lungs, and nervous system, nothing abnormal discovered.

Pre-operative Diagnosis.—Acute inflammation of a vermiform appendix situated under the liver.

Operation.—At 9.45 P.M. on the 21st, under general anæsthesia (A.C.E. and ether), by Mr. W. Thomas. No tumour palpable. Right paramedian incision 4 in. in length, extending upwards from the umbilicus. The cæcum came up freely into the wound and the appendix appeared normal. The appendix was removed. A flake of lymph was observed to come down from the right upper abdomen. On prolongation of incision upwards, the stomach, gall-bladder, and first stage of duodenum were found to be normal. In the area between the duodenum and the gall-bladder and situated on the posterior abdominal wall was a lump, surrounded by an area of infiltration and *œdema, and situated in front of the* kidney, which could be moved behind it. The gastro-colic omentum was opened and the pancreas found to be apparently normal. An incision was made through the posterior peritoneum above and to the outer side of the duodenum; it was then possible to separate out a pouch from the retroperitoneal tissues. This pouch had a diameter of 1 in., and was thin-walled and black in its centre. (Fig. 1 shows a section of the apex of this diverticulum.) The mucosa was black; the pouch was empty except for a small amount of friable golden-yellow debris; in the lower portion there was a communication into the duodenum in the region of the ampulla of Vater which would admit the little finger. The diverticulum was not connected with the bile ducts. It was cut away, the neck being sutured with a running catgut suture; an endeavour being made to put in a second invaginating suture, bleeding occurred from the inner portion of the neck, and this suture had to be abandoned and the bleeding controlled. The posterior peritoneum was sutured as best possible, but was extremely friable. Stab drainage laterally. Abdomen closed in layers and with tension sutures.

Progress.—Three days after operation the stab wound started to discharge freely and there was a fistulous communication. On the tenth day the stitches were removed, the laparotomy wound having healed by first intention; discharge from the stab wound was diminishing. On the seventeenth day the discharge had ceased and the stab wound was granulating. Patient was sent to convalescent home on twenty-first day.

In conclusion, my thanks are due to Sir Hugh Rigby and Mr. A. J. Walton for kindly giving me permission to publish their cases.

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BY W. M. *FORD* ROBERTSON.

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As stated in the paper there are, at least, four distinct methods by which the validity of this hypothesis might be tested: 1. Direct microscopic examination of cancer cells. The rods were demonstrated many years ago (THE LANCET, Jan. 28th, 1908) by my father's *palladium methyl-violet* method; they occur chiefly within the nucleus and the infected cells occur in special areas; throughout the greater part of the tumour it may be impossible to observe any of these rods. 2. Artificial cultivation of the supposed bacteria. The evidence of this kind obtained up to the time at which the paper was published, as pointed out by the author, was, "perhaps not so decisive as that of the other three methods," but *was sufficiently striking.* He had isolated anaerobic bacilli of the diphtheroid group from eight carcinomata of the *breast.* It is to fill up this gap in the evidence then put forward that the present research has been undertaken. 3. The experimental production of cancer. Either pure cultures of the anaerobic diphtheroid bacillus, or of cultures of this micro-organism, together with cultures of a staphylococcus obtained from the human cases investigated, were *inoculated into mice. Carcinomata* were produced in one series of cases, positive results being obtained in all *(100* per cent.) of five mice inoculated by the anaerobic diphtheroid bacillus and a mannite non-fermenting staphylococcus obtained from the same human case of adeno-carcinoma of mamma. In this experimental work it was recorded that micro-organisms obtained from a cancerous growth in the human subject produced cancerous growths, primary, in *various organs* (kidney, pancreas, uterus, &c.) of the different mice inoculated. 4. Focal reaction and therapeutic immunisation. Several cases of human carcinomata were recorded in which definite focal and general reactions occurred after inoculation with a vaccine prepared from the *diphtheroid* bacillus. Of certain of these cases, after such vaccine treatment, the neoplasms had decreased in size, the pain and discomfort from the growth were greatly diminished. *One case* of recurrence *after* operation was treated, the recurrent growths disappeared, and, at the present time of writing *(July, 1923), the patient* is still alive, active, and able to pursue his occupation, that of a labouring man.

To complete the cultural evidence it was obvious that a modification of the methods employed up to the date of the paper at the end of 1921 was necessary. Dr. Ford Robertson introduced into his technique the *de-aeration* of pure sheep's serum and, also, of de-aerated hæmoglobin serum glucose agar medium.

Before the value of these media could be tested thoroughly Dr. Ford Robertson was taken ill, and the work was carried on by me. The present paper is a record of this work.

Throughout my investigation I was in constant personal communication with my father, and, as a result of my work, both cultural *and therapeutic,* he requested me, shortly before he died, to state that he was convinced that the cause of and a cure for *cancer*

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2. *Preparation of De-Aerated Hæmoglobin Serum Glucose Agar* (*Glucose Agar* + 12).—After pouring off the serum from the blood in the large tubes as described above, the blood-clot is allowed to stand for a further 48 hours. To produce lysis of the corpuscles the tubes are kept overnight in a freezing mixture of salt and water, after which they are warmed up in a basin of water at 60° C. for 10 minutes. They are then kept 24 hours before decanting into large sterile tubes. The hæmoglobin serum is then de-aerated by the same method as described for de-aeration of the pure serum. Freshly sterilised agar, in a test-tube of ordinary size, is cooled down to about 70° C., and a few drops of the de-aerated hæmoglobin serum are added and mixed. The tubes are sloped and the contents allowed to solidify. A sterile cotton-wool plug, half an inch in length, is pushed down to just above the upper limit of the agar. A small amount of pyrogallic acid is shaken on to the top of the plug, a few drops of sodium hydroxide solution (10 per cent. in water) are added, and the test-tube is sealed by a cork soaked in boiling paraffin wax. The tubes are incubated at 37° C. for 24 hours to test their sterility, and are then stored for use. The glucose agar is made according to the technique given in "Therapeutic Immunisation in Asylum and General Practice," by W. Ford Robertson, Chap. V., "Bacteriological Methods." The acidity of the agar is + 12.

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when the pylorus and the first portion of the duodenum were removed and anastomosis performed. Mr. Walton's case quoted above affords a similar example.

Case Record.—Married woman aged 27; occupation, household duties.

Past History.—Influenza. No history of indigestion of any description.

Present Illness.—Onset March 20th, 1923, at 1 P.M. Abdominal pain in epigastric region, of a dragging character and giving rise to a feeling of nausea. Later the pain settled in right hypochondrium. Vomited four times.

Progress.—On the 21st, at 3 A.M., pain became worse and persisted until 8 A.M., when it lessened somewhat. Bowels regular; micturition not affected.

Condition on Admission.—Thin woman with a sallow complexion. Temperature 101·3° F., pulse 108 per minute. Abdomen: Marked tenderness and rigidity of the upper half of the right rectus muscle; no palpable tumour; muscles of lower right abdomen flaccid. Hyperæsthesia nil. Urine, heart, lungs, and nervous system, nothing abnormal discovered.

Pre-operative Diagnosis.—Acute inflammation of a vermiform appendix situated under the liver.

Operation.—At 9.45 P.M. on the 21st, under general anæsthesia (A.C.E. and ether), by Mr. W. Thomas. No tumour palpable. Right paramedian incision 4 in. in length, extending upwards from the umbilicus. The cæcum came up freely into the wound and the appendix appeared normal. The appendix was removed. A flake of lymph was observed to come down from the right upper abdomen. On prolongation of incision upwards, the stomach, gall-bladder, and first stage of duodenum were found to be normal. In the area between the duodenum and the gall-bladder and situated on the posterior abdominal wall was a lump, surrounded by an area of infiltration and œdema, and situated in front of the kidney, which could be moved behind it. The gastro-colic omentum was opened and the pancreas found to be apparently normal. An incision was made through the posterior peritoneum above and to the outer side of the duodenum; it was then possible to separate out a pouch from the retro-peritoneal tissues. This pouch had a diameter of 1 in., and was thin-walled and black in its centre. (Fig. 1 shows a section of the apex of this diverticulum.) The mucosa was black; the pouch was empty except for a small amount of friable golden-yellow debris; in the lower portion there was a communication into the duodenum in the region of the ampulla of Vater which would admit the little finger. The diverticulum was not connected with the bile ducts. It was cut away, the neck being sutured with a running catgut suture; an endeavour being made to put in a second invaginating suture, bleeding occurred from the inner portion of the neck, and this suture had to be abandoned and the bleeding controlled. The posterior peritoneum was sutured as best possible, but was extremely friable. Stab drainage laterally. Abdomen closed in layers and with tension sutures.

Progress.—Three days after operation the stab wound started to discharge freely and there was a fistulous communication. On the tenth day the stitches were removed, the laparotomy wound having healed by first intention; discharge from the stab wound was diminishing. On the seventeenth day the discharge had ceased and the stab wound was granulating. Patient was sent to convalescent home on twenty-first day.

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when the pylorus and the first portion of the duodenum were removed and anastomosis performed. Mr. Walton's case quoted above affords a similar example.

Case Record.—Married woman aged 27; occupation, household duties.

Past History.—Influenza. No history of indigestion of any description.

Present Illness.—Onset March 20th, 1923, at 1 P.M. Abdominal pain in epigastric region, of a dragging character and giving rise to a feeling of nausea. Later the pain settled in right hypochondrium. Vomited four times.

Progress.—On the 21st, at 3 A.M., pain became worse and persisted until 8 A.M., when it lessened somewhat. Bowels regular; micturition not affected.

Condition on Admission.—Thin woman with a sallow complexion. Temperature 101·3° F., pulse 108 per minute. Abdomen: Marked tenderness and rigidity of the upper half of the right rectus muscle; no palpable tumour; muscles of lower right abdomen flaccid. Hyperæsthesia nil. Urine, heart, lungs, and nervous system, nothing abnormal discovered.

Pre-operative Diagnosis.—Acute inflammation of a vermiform appendix situated under the liver.

Operation.—At 9.45 P.M. on the 21st, under general anæsthesia (A.C.E. and ether), by Mr. W. Thomas. No tumour palpable. Right paramedian incision 4 in. in length, extending upwards from the umbilicus. The cæcum came up freely into the wound and the appendix appeared normal. The appendix was removed. A flake of lymph was observed to come down from the right upper abdomen. On prolongation of incision upwards, the stomach, gall-bladder, and first stage of duodenum were found to be normal. In the area between the duodenum and the gall-bladder and situated on the posterior abdominal wall was a lump, surrounded by an area of infiltration and œdema, and situated in front of the kidney, which could be moved behind it. The gastro-colic omentum was opened and the pancreas found to be apparently normal. An incision was made through the posterior peritoneum above and to the outer side of the duodenum; it was then possible to separate out a pouch from the retroperitoneal tissues. This pouch had a diameter of 1 in., and was thin-walled and black in its centre. *(Fig. 1 shows a section of the apex of this diverticulum.)* The mucosa was black; the pouch was empty except for a small amount of friable golden-yellow debris; in the lower portion there was a communication into the duodenum in the region of the ampulla of Vater which would admit the little finger. The diverticulum was not connected with the bile ducts. It was cut away, the neck being sutured with a running catgut suture; an endeavour being made to put in a second invaginating suture, bleeding occurred from the inner portion of the neck, and this suture had to be abandoned and the bleeding controlled. The posterior peritoneum was sutured as best possible, but was extremely friable. Stab drainage laterally. Abdomen closed in layers and with tension sutures.

Progress.—Three days after operation the stab wound started to discharge freely and there was a fistulous communication. On the tenth day the stitches were removed, the laparotomy wound having healed by first intention; discharge from the stab wound was diminishing. On the seventeenth day the discharge had ceased and the stab wound was granulating. Patient was sent to convalescent home on twenty-first day.

In conclusion, my thanks are due to Sir Hugh Rigby and Mr. A. J. Walton for kindly giving me permission to publish their cases.

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FURTHER RESEARCH ON THE RELATION OF CARCINOMA TO INFECTION.

By W. M. FORD ROBERTSON.

In a paper by my late father, Dr. William Ford Robertson,[1] read before the Section of Pathology and Bacteriology[2] of the British Medical Association, Newcastle-upon-Tyne, July, 1921, he recorded that certain rods which he had observed within cancer cells were anaerobic bacilli of the diphtheroid group of micro-organisms. Further, he brought forward evidence to show that the continued proliferation of the epithelial cells was due to the action of these bacteria.

As stated in the paper there are, at least, four distinct methods by which the validity of this hypothesis might be tested: 1. Direct microscopic examination of cancer cells. The rods were demonstrated many years ago (The Lancet, Jan. 28th, 1908) by my father's palladium methyl-violet method; they occur chiefly within the nucleus and the infected cells occur in special areas; throughout the greater part of the tumour it may be impossible to observe any of these rods. 2. Artificial cultivation of the supposed bacteria. The evidence of this kind obtained up to the time at which the paper was published, as pointed out by the author, was, "perhaps not so decisive as that of the other three methods," but was sufficiently striking. He had isolated anaerobic bacilli of the diphtheroid group from eight carcinomata of the breast. It is to fill up this gap in the evidence then put forward that the present research has been undertaken. 3. The experimental production of cancer. Either pure cultures of the anaerobic diphtheroid bacillus, or of cultures of this micro-organism, together with cultures of a staphylococcus obtained from the human cases investigated, were inoculated into mice. Carcinomata were produced in one series of cases, positive results being obtained in all (100 per cent.) of five mice inoculated by the anaerobic diphtheroid bacillus and a mannite non-fermenting staphylococcus obtained from the same human case of adeno-carcinoma of mamma. In this experimental work it was recorded that micro-organisms obtained from a cancerous growth in the human subject produced cancerous growths, primary, in various organs (kidney, pancreas, uterus, &c.) of the different mice inoculated. 4. Focal reaction and therapeutic immunisation. Several cases of human carcinomata were recorded in which definite focal and general reactions occurred after inoculation with a vaccine prepared from the diphtheroid bacillus. Of certain of these cases, after such vaccine treatment, the neoplasms had decreased in size, the pain and discomfort from the growth were greatly diminished. One case of recurrence after operation was treated, the recurrent growths disappeared, and, at the present time of writing (July, 1923), the patient is still alive, active, and able to pursue his occupation, that of a labouring man.

To complete the cultural evidence it was obvious that a modification of the methods employed up to the date of the paper at the end of 1921 was necessary. Dr. Ford Robertson introduced into his technique the de-aeration of pure sheep's serum and, also, of de-aerated hæmoglobin serum glucose agar medium.

Before the value of these media could be tested thoroughly Dr. Ford Robertson was taken ill, and the work was carried on by me. The present paper is a record of this work.

Throughout my investigation I was in constant personal communication with my father, and, as a result of my work, both cultural and therapeutic, he requested me, shortly before he died, to state that he was convinced that the cause of and a cure for cancer

had been discovered. The laboratory findings recorded in the present publication were demonstrated in the Section of Pathology and Bacteriology at the recent annual meeting of the British Medical Association.

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[1] An obituary notice of Dr. W. Ford Robertson appeared in The Lancet of July 28th.—Ed. L.

[2] The Lancet, 1921, ii., 335; Brit. Med. Jour., 1921, ii., 929.

Preparation of Media.

1. *Preparation of De-Aerated Sheep Serum (D.A.S. Medium).*—For many years Dr. W. Ford Robertson kept a small flock of sheep solely for the purpose of obtaining blood or serum. A large hollow needle having been sterilised in boiling vaseline, the excess of vaseline is shaken out, and the needle is transferred to a sterile test-tube which is plugged. The sheep is placed and secured on a trestle sufficiently high to keep the feet off the ground. The side of the neck is clipped, lathered, and shaved. The wool around the shaved part is soaked with a solution of carbolic acid and the shaved skin cleansed with 1 : 50 (about) carbolic acid. The external jugular vein is made to stand out prominently by pressure applied to the lower end. The large sterile needle is inserted into the vein at its upper end, and the blood is allowed to flow through the needle into 6 in. by 1 in. test-tubes, about 40 c.cm. of blood being collected in each tube. Twelve tubes are taken at each bleeding. The blood is allowed to stand for not more than 24 hours, and then the serum is pipetted or drained off. Any tube in which the serum is cloudy and showing a scum on the surface is discarded (*Bacillus subtilis* is the most frequent contamination found). Some of the tubes occasionally have shown a fatty layer floating on the surface of the serum after 24 hours. This is thick and creamy in character, being quite distinct from the cloud and scum produced by *B. subtilis*. After decanting the serum into sterile test-tubes of ordinary size (5 in. by ½ in.), each of which is half filled, the fatty substance may continue to appear. As many as four centrifugings have had to be done in order to clear the serum. The centrifuged deposits have been microscopically examined and proved to consist of fat globules, all inoculations from these deposits on to hæmoglobin agar, &c., have proved them to be entirely free from micro-organisms. The ordinary tubes are plugged lightly and then transferred to an air-tight bottle attached to a Geryk pump. Air is exhausted until the serum begins to froth, further air being extracted when this frothing has ceased. The process is repeated every 15 minutes throughout the day. The tubes are incubated in vacuo until required for use, a periodical examination being made for the presence of cloud or marked deposit. Any so affected are centrifuged and tested for sterility. If the serum remains clear from the beginning, contamination rarely occurs later if care is taken with the plugging before storage. The presence of the fat, however, may give a little trouble, but this merely requires the serum to be centrifuged and the clear fluid decanted into a fresh sterile tube. In some cases it has been found useful to acidify the de-aerated serum by bubbling CO_2 gas through it for five minutes (D.A.S. + CO_2). When required for use the de-aerated sheep serum is decanted into small tubes measuring 2 in. by ¼ in., which are sealed with corks soaked with boiling paraffin wax.

2. *Preparation of De-Aerated Hæmoglobin Serum Glucose Agar (Glucose Agar + 12).*—After pouring off the serum from the blood in the large tubes as described above, the blood-clot is allowed to stand for a further 48 hours. To produce lysis of the corpuscles the tubes are kept overnight in a freezing mixture of salt and water, after which they are warmed up in a basin of water at 60° C. for 10 minutes. They are then kept 24 hours before decanting into large sterile tubes. The hæmoglobin serum is then de-aerated by the same method as described for de-aeration of the pure serum. Freshly sterilised agar, in a test-tube of ordinary size, is cooled down to about 70° C., and a few drops of the de-aerated hæmoglobin serum are added and mixed. The tubes are sloped and the contents allowed to solidify. A sterile cotton-wool plug, half an inch in length, is pushed down to just above the upper limit of the agar. A small amount of pyrogallic acid is shaken on to the top of the plug, a few drops of sodium hydroxide solution (10 per cent. in water) are added, and the test-tube is sealed by a cork soaked in boiling paraffin wax. The tubes are incubated at 37° C. for 24 hours to test their sterility, and are then stored for use. The glucose agar is made according to the technique given in "Therapeutic Immunisation in Asylum and General Practice," by W. Ford Robertson, Chap. V., "Bacteriological Methods." The acidity of the agar is + 12.

3. *Other Media Used.*—Other media used have been made according to the instructions contained in "Therapeutic Immunisation in Asylum and General Practice" referred to above. In some cases Dorset egg medium has been made with the addition of de-aerated hæmoglobin serum, and has proved a valuable medium in the research. In several instances, to obtain the earlier subcultures, Dorset egg medium was necessary.

Technique for Inoculation of Media.—A small cube of about ¼ in. square is cut out with strict aseptic precautions from the deeper margin of a neoplasm removed at operation. Culture must be made not later than 8 to 12 hours after operation. With lymphatic glands containing metastatic growths the whole gland may be used if small enough. The cube removed is cut up into small portions of such size as to be capable of insertion into the 2 in. by ¼ in. test-tubes. (*a*) One of these portions of tissue is pushed down with a sterile glass rod into each of two D.A.S. tubes and into two D.A.S. + CO_2 tubes until it is just below the surface of the medium. The paraffin cork is re-heated and re-inserted. The tubes are then incubated at 37° C. (*b*) The remaining pieces of the tissue are cut up into small fragments and placed in a strong test-tube containing ¼ inch of sterile ground glass. About ½ in. of sterile normal saline solution is added and the whole ground up by a sterile glass rod. A few loopfuls of this solution are used to inoculate the following media: (1) One or two tubes containing "glucose agar + 12" medium and rendered anaerobic by the pyrogallic acid method (see above). (2) One tube containing Dorset egg medium; after inoculation the air is displaced by CO_2 gas and the tube is sealed with a plug of wool soaked in hot paraffin. (3) Instead of tube (4) in some cases Dorset egg medium, to which had been added de-aerated hæmoglobin serum (see above) is used. After inoculation the air is displaced by CO_2. (5) Two tubes containing ordinary hæmoglobin agar + 18. One of the tubes is rendered anaerobic by the pyrogallic method, the other being incubated anaerobically. (6) One tube containing ordinary lactose serum agar incubated aerobically. All these tubes were incubated at 37° C.

Addendum on Technique.—Recently a modification of the cultural technique has been employed which has proved of great use in making early subcultures and in dealing with weekly growing strains of the anaerobic diphtheroid bacillus. This technique was devised to bridge over the gap existing between the fluid D.A.S. and D.A.S. + CO_2 media and the comparatively dry condition of the surface media in the glucose agar + 12 tubes, the transition from one to the other being too sharp. A small amount of D.A.S. was poured into a tube containing glucose agar + 12 medium sufficient to form a layer 1 mm. thick and allowed to collect at the bottom. The surface of the tube was then inoculated with a loopful or more of the deposit. A small sterile plug was next inserted and pushed down a short distance from the upper limit of the medium. On this plug a layer of ⅛ in. finely powdered calcium chloride was dropped, which was covered by another sterile wool plug ½ in. in thickness. On this plug a thin layer of pyrogallic acid was laid, and a few drops of sodium hydroxide (10 per cent. sol.) was added. The mouth of the tube was then sealed with a cork previously soaked in boiling paraffin wax. The tube is now laid flat, so that the serum formed an even layer over the medium, the whole being incubated for 36 hours. After this time the calcium chloride has absorbed all the water from the

serum and a dry or sticky surface is left. The tube can be incubated in a vertical position. This method has been found valuable also in increasing the vigour of pure anaerobic growths after prolonged subculture and incubation. Three different strains of anaerobic diphtheroids from separate cases have been restored to vigour by this means.

Examination of Culture Media.

All the inoculated tubes (1) to (6) inclusive in the previous paragraphs were examined for growth after 24 to 48 hours' incubation. Those tubes showing no visible growth, or only a sparse growth, were replaced in the incubator. From those tubes in which there was a copious growth, films were made and stained by Gram-neutral red method and examined microscopically. A note was made as to the group of micro-organisms (streptococci, staphylococci, &c.) present, but no further investigation of these was made except in those particular instances in which subsequent examination of the anaerobic diphtheroid bacillus, subcultured from the D.A.S. culture, showed micro-organisms resembling somewhat streptococcal forms. In such cases any streptococcal colonies and suspected diphtheroid colonies were subjected to a series of biochemical tests to differentiate the species (lactose, mannite, salicin, and lactose serum broth).

With reference to the D.A.S. and D.A.S. + CO_2 tubes it was found that the time required for primary incubation varied according to the malignancy of the neoplasm. The more malignant the tumour, the shorter the time required before examination. For example, in the case of a rapidly growing epithelioma, the anaerobic diphtheroid bacillus was found in enormous numbers after four days' incubation at 37° C., whereas, in an atrophic scirrhus, after one week's incubation at 37° C., comparatively few diphtheroid bacilli were present. In some cases the serum in the tubes became cloudy owing to the presence of streptococci, but these tubes, as well as those in which the serum remained clear, showed a white deposit varying greatly in amount. A loopful of the deposit, or if the latter was copious, a little removed in a capillary tube, was used to make a thin film. It was found better to dilute the serum on the slide with distilled water, to avoid too deep staining of the background. The film was stained by Gram neutral red. As in any film containing serum, decolorisation by alcohol was continued only until the violet stain ceased to stream away. If an attempt was made to decolorise the background completely all the micro-organisms on the film would naturally be decolorised. Further, the gentian-violet solution was filtered on to the preparation. It was found that the white deposit consisted of bacteria and disintegrated tissue. Often partially disintegrated epithelial cells were seen. The background consisted of a very finely granular field which should not be mistaken for micro-organisms and is present in films made of uninoculated serum. The amount of white deposit was found to have a relationship to the numbers of micro-organisms present other than the anaerobic diphtheroid bacillus. The greater the number of streptococci, staphylococci, &c., present, the larger the deposit. The growth was then subcultured from the primary growth in D.A.S. and D.A.S. + CO_2 media. The white deposit in the primary D.A.S. and D.A.S. + CO_2 culture was used to inoculate the Dorset egg + CO_2 medium and G.Ag + 12. Two tubes of each of these media were used. These subculture tubes were incubated at 37° C. The colonies of the diphtheroid bacillus were visible on the egg medium after three to seven days, but, owing to delay in examination, consequent on the large number of tubes dealt with, the colonies had, in some cases, become quite large when first examined. Further subcultures were made to obtain the anaerobic diphtheroid bacillus in pure growth. The media used for these subcultures were either Dorset egg medium + CO_2 or glucose agar + 12 according to the medium on which the first subculture of the particular strain had grown best. For study of characteristics of colonies and picking of them off for pure subcultures, a strong hand-lens was used with double-jointed movable spring clip. The clip attaches the lens to the tube, thereby allowing the apparatus to be slipped along the tube and focused easily on any particular colony. The tube with clip attached is held in the left hand, and the platinum needle is inserted and a colony picked off under the lens.

Cultural Characters and Morphology of the Anaerobic Diphtheroid Bacillus.

In pure cultures on Dorset egg medium + CO_2, to which a few drops of alcoholic solution of basic fuchsin have been added, after 24 to 48 hours the colonies, as seen through a strong hand-lens, appeared as minute rounded, semi-transparent, white or pinkish growths. In those cases in which the colonies were pinkish the colour was due to the bacilli having taken up the stain, as when removed by the platinum needle the colony on the needle showed the pinkish coloration. The colonies were soft and slightly sticky, except in one case in which the culture was first examined after six days, and showed soft colonies and colonies which were granite-like and very difficult to break up.

In pure culture on glucose agar + 12, after 24 to 48 hours, the colonies as seen under a strong hand-lens, appeared as minute round transparent moist colonies. Subsequently as they increased in size they became semi-transparent and later yellow or greenish-yellow, while the medium became cloudy and dirty brown. Again, other species took on a pink coloration, with very little change in the medium. After about two weeks' incubation at 37° C. the colonies were the same dirty-brown colour as the medium.

Films of the anaerobic diphtheroid bacillus made from cultures show it to be an incompletely Gram-fast rod. In de-aerated serum the micro-organism occurs singly and in clumps, its length varying from 0·5 to 2 microns, its breadth being 0·2 micron. On Dorset egg medium + CO_2 and on glucose agar + 12 the micro-organism frequently shows pleomorphism. Numerous short coccoid forms occur, these being found sometimes in chains of five or six elements. The elements forming the chains are connected by a faintly staining filamentous sheath. Small rods in short-chain formation, with or without connecting filamentous sheath, occur. Some strains are uniformly longer rods 1·5 to 2 microns in length; curved and V-shaped forms are seen also. Other strains are uniformly short, being 1 micron in length. Bacilli with a thick club-shaped extremity and bacilli with a bulbous centre occur occasionally, especially in old cultures.

Material Examined.

The series examined in the present research consists of 15 cases of malignant disease. It comprises six cases of adeno-carcinoma of the mamma, three being scirrhus and three being encephaloid in type: One case of primary liver-celled carcinoma and the discharge from the wound after operation, one case of squamous-celled carcinoma, metastatic in submaxillary lymphatic gland, the primary neoplasm being from the lower lip; one case of carcinoma of the maxillary sinus; one case of sarcoma of the maxilla; one case of adeno-carcinoma of rectum; one case of adeno-carcinoma of the ovary, papilliferous in type; one case of squamous-celled carcinoma of cheek; one case of squamous-celled carcinoma of glans penis; swab from squamous-celled carcinoma of the cheek. From all these 15 cases the anaerobic diphtheroid bacillus has been demonstrated in cultures. In seven cases the bacillus was obtained subsequently in pure cultures in sufficient quantity for vaccines to be prepared and used therapeutically. The results obtained by this vaccine treatment will be published later. In all 15 cases a mannite non-fermenting staphylococcus was isolated, and in about two-thirds of the series streptococci were present also. In nearly every instance these staphylococci and streptococci were obtained only in anaerobic cultures. Two control cases were examined. In one case subcutaneous fat, and, in the other case, muscle of patients who were not the subject of malignant disease, gave negative results for the anaerobic diphtheroid bacillus.

I wish to express my gratitude to the various surgeons in Edinburgh and in Dunfermline, who have supplied me with material for this investigation, and especially to Mr. George Chiene and to Mr. Pirie Watson, who have given me every facility for carrying out the work. I am indebted also to Mr. Becker for his great kindness in helping me to collect the material, and to Dr. Batty Tuke for the interest he has shown and the encouragement he has given me.

Reviews and Notices of Books.

HEREDITY AND EUGENICS.

By R. R. GATES, *Ph.D.*, *Professor of Botany in the University of London*. London: Constable and Co. 1923. Pp. 288. 21s.

THIS entertaining book should be closely read by all who are interested in human inheritance, especially if they approach the subject with the idea of doing something to make man better than he is. After a general introduction the author gives a pretty full account of what is known about the inheritance of abnormalities in man, a long discussion on twins and their resemblances, and concludes with a survey of the mass of questions involved in "eugenics" and "*population*." There is a good bibliography of books and papers. Two conclusions come out particularly prominently.

In the first place, it is plain that there are many doors of human inheritance which the key of Mendelism in its simplest form will not unlock, and when Mendelism passes on to reversed dominance, multiple factors, and such like, the practical sociologist may well feel that the problem is more difficult than he thought it was. It is well that he should do so, for there has been much easy talk in recent years of the possibility of the regeneration of man if only geneticists could have their way. Left-handedness, for example, was originally found to be a simple Mendelian recessive character. More recent investigation has, however, suggested that the mode of inheritance is not altogether clear, and that right- and left-handedness are not alternative characters but in their most marked forms the ends of a series with a large number of intermediate gradations—i.e., that many factors are involved. In the second place, one is impressed by the fact that even if the modes of inheritance of undesirable and desirable human qualities were known, it would be by no means an easy matter to eradicate or cultivate them unless the character in question is a simple dominant with a single factor. There is no particular reason for abolishing bradydactyly, but as it is a simple dominant character it could be kept under by preventing anyone who showed it from breeding and keeping a close watch for its possible reappearance de novo.

But musical ability and feeble-mindedness are recessive characters, and when the homozygous have been mated together or sterilised as may be appropriate the human breeder has still to deal with the heterozygous individuals who are carrying but not showing the character. It is reckoned, for example, that in the United States about 3 per 1000 of the population are mentally defective, and that at least 70 per 1000 are carrying mental deficiency as a recessive character. If the former mate together there is a certainty of defective children; if two of the latter happen to marry—and the chance is obviously not a very small one, even if cousin matings are barred—a quarter of their offspring will be defective. As Prof. R. C. Punnett has pointed out, it would take some 250 generations, or about 8000 years, to reduce the feeble-minded from 3 per 1000 to 1 per 100,000 by simply segregating or sterilising those who show the character. And when it comes to characters which are not single factors, the complications seem almost insuperable. Truly it seems sometimes that the function of natural knowledge is to explain why things are as they are without giving us any easy way by which to make them better. No doubt in the end it will be possible to do a good deal, but the time for action on a large scale has certainly not arrived yet.

An interesting discussion of the effects of racial interbreeding points out that in fact very few detailed studies have been made; such information as there is suggests strongly that the miscegenation of races which are far apart in the scale of social and intellectual development or markedly dissimilar physically is likely to give results which are in general bad, owing to a disharmonious mixture in the offspring violating the unity and wholeness which are characteristic of a perfect individual. The colour question needs clear thinking in all its aspects; it appears that facts to think about are wanted even more. Many of the qualities which future generations will value most highly may well be recessive.

HERNIA AND ITS RADICAL CURE.

By J. HUTCHINSON, F.R.C.S. Eng., Consulting Surgeon, London Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 264. 12s. 6d.

THE frequency with which operations for hernia are nowadays performed has led to the difficulties being sometimes under-estimated, and we must admit that a few years ago hernia operations on soldiers were followed in too many cases by recurrence and other complications that could have been avoided by more careful and accurate methods. Mr. Hutchinson's book is therefore doubly welcome, for from the fruits of a wide experience he has made it his aim to give a practical account of hernia and the best methods for its radical cure. Many of the technical details that the author describes have been originated by himself, and while his methods are mainly in accordance with those used by the majority of British surgeons, he describes fully the less orthodox methods of others: in this way a thoroughly up-to-date account has been produced, and comparisons of various procedures are made in a fair and broad-minded spirit.

Mr. Hutchinson does not hold the view that the majority of inguinal hernias have a congenital origin, and he considers that nearly all umbilical and femoral hernias are acquired. A full and valuable account is given of the contents of hernial sacs, and special interest attaches to the sections on hernia of the vermiform appendix and of the urinary bladder, and on the various forms of fatty hernia. In inguinal hernia, where there is a well-developed conjoined tendon, the author sutures this tendon in front of the cord to the external oblique just above Poupart's ligament, thus allowing the cord to remain in its normal bed formed by that ligament; if the conjoined tendon is poorly developed Halsted's operation is preferred. The difficulties and dangers of operation for recurrent inguinal hernia are dealt with and, many exceptions being admitted, the general rule is laid down that it is better not to operate again where a suitable truss effectively controls a recurrent inguinal hernia. For imperfect descent of the testicle early operation is advocated, the testicle being brought down to the scrotum; the means of keeping it there are indicated. In femoral hernia the author is accustomed to operate from below and to suture Poupart's ligament to the pectineus fascia, but he also describes and discusses fairly Lotheisen's method that has become popular among so many other surgeons. For umbilical hernia Mr. Hutchinson describes his own method of closing the abdominal wall by two rows of sutures, the first a layer of mattress stitches taking tension off the second row. He is a firm advocate of the use of kangaroo tendon sutures, and he brings forward evidence to show that these are not absorbed but become incorporated in the body as firm fibrous tissue, with considerable advantages over catgut on the one hand, and such substances as silk and silkworm gut, which persist as foreign bodies. Metal filigrees are condemned and the author's opinions are confirmed by the increasing rarity with which such materials have been employed in recent years. The diagnosis and treatment of strangulation are well described; where resection is necessary Mr. Hutchinson advises delivery of the bowel through a separate abdominal incision and he is in favour of end-to-end anastomosis.

The interest and value of the book are enhanced by the frequent descriptions of unusual cases and the numerous references to recent literature; its size has been limited by the omission of such details of anatomy, differential diagnosis, and treatment by trusses as have received full attention in many text-books; instead, the author has devoted himself primarily to a detailed account of the operative measures which in his large experience he has found suitable to all the different forms of hernia. As he writes clearly and his technical descriptions are easy to follow and well illustrated by diagrams, Mr. Hutchinson has fulfilled his object of producing a book of value to surgeons on a subject of considerable importance to the community.

The Mechanism of Facial Expression.

Der Gesichtsausdruck und seine Bahnen, beim Gesunden und Kranken besonders beim Geisteskranken. By Prof. Dr. Theodor Kirchhoff in Schleswig. Berlin: Julius Springer. 1922. With 68 illustrations. Pp. 227. 9s.

The clinical part of this interesting monograph is peculiarly full and detailed; that dealing with pathological physiology is somewhat unsatisfactory. Prof. Kirchhoff apparently accepts without criticism the view that a second (non-pyramidal) facial path exists, extending from the cortex to the thalamus and from the latter ganglion to the nucleus ruber and so by rubro-pontine paths to the facial nucleus. This "affektbahn," however, is, to say the least, problematical. Many difficulties connected with the assigning to the optic thalamus of the function of emotional expression are not, we consider, sufficiently tackled by the author, who relies largely on observations now somewhat old, and does not, in our opinion, meet successfully the objections raised by Roussy to a thalamic localisation for emotional play of feature. The monograph is none the less instructive and readable, and supplies in convenient compass a great deal of clinical material of interest both to psychiatrist and neurologist.

The Corneo-Scleral Dome.

La calotte cornéo-scleral. By Dr. F. Terrien, Ophthalmologist to the Beaujon Hospital, Paris. With 144 figures. Paris: Masson et Cie. 1923. Pp. 260. Fr.25.

This treatise appears as one of a series entitled "Sémiologie Oculaire." The same author has previously written a work on the surgery of the eye and its annexes, and in attempting to deal solely with the anatomy, physiology, and pathology of the anterior part of the globe has set himself a somewhat thankless task. As far as conjunctival infections go, they can, it is true, be dealt with satisfactorily without reference to the rest of the eye, and this is perhaps also true of superficial affections of the cornea. Interstitial keratitis, however, may or may not be attended by inflammation of the iris and choroid, and the sign popularly known as "keratitis punctata" is always the result of a cyclitis. Again, penetrating wounds of the cornea involve the possibility of prolapse of the iris, of traumatic cataract, and of the presence of a foreign body in the globe. All this necessitates considerations which go far deeper than the corneo-scleral dome, and accordingly, in this treatise, we have the radiographic diagnosis of foreign bodies and the methods of their extraction by the giant, and by the small electro-magnet. Similarly, the proper treatment of serpiginous ulcer of the cornea cannot be carried out without a knowledge of the bacteriology and surgery of the lacrymal sac. These facts are not ignored, but they are perhaps hardly given their due weight in this book. Looking for compensating advantages in Dr. Terrien's method of approaching his subject, we find a useful description of the examination of the cornea in the living subject by the corneal microscope and slit lamp, and an excellent figure showing the magnified vessels, both blood and lymph, of the limbus. The bulk of the book, however, resembles chapters out of an ordinary text-book. Terrien can write most interestingly of his own original observations, as in his book on oculo-orbital sequelæ, but in this book the advantages over the average full text-book are not very apparent.

Inflammation of Bones and Joints.

By Leonard W. Ely, M.D., Associate Professor of Surgery, Stanford University. London and Philadelphia: J. B. Lippincott Co. 1923. Pp. 433. 30s.

The treatment of diseases of joints has advanced but little of recent years, so that we turn to a monograph dealing with this branch of surgery with some interest. Prof. Ely's book treats of bone diseases as well as affections of joints. On the whole it is disappointing. In bulk it occupies considerably more space than is devoted to these subjects in the ordinary student's text-book of surgery, yet the reader will get little more help and information from it. Splints and apparatus are scarcely more than mentioned; there is no detailed description of their application. There is no account of the filling of bone cavities with pedicled muscular or with fat-grafts, nor do we find any reference to Wilms's method of treating septic joints. The author ascribes the localisation of bacteria in the ends of bones to the marrow in this situation being of a particular type, the lymphoid type, but he leaves only a vague impression as to what he really means by this. Speaking of the diagnosis of tuberculous joints, he points out that many non-tuberculous joint infections have on clinical grounds been regarded as due to the tubercle bacillus, and that such a diagnosis can only be established with certainty by the demonstration of the organisms in the joint fluid or synovial membrane. Prof. Ely's views on the influence of age upon the treatment of tuberculous joints are interesting and worth further investigation. He believes that this infection only attacks the synovial membrane and the lymphoid marrow of the bone-ends. Whilst it is possible to remove these two tissues in adults, it is quite impossible in children. Therefore, in adults resection should be the rule. Loss of joint function leads to disappearance of synovial membrane, a change in the marrow of the adjacent bones, and an inability of the disease to progress. He is satisfyingly frank about the results of our treatment in certain cases of chronic rheumatoid arthritis, stating that no known remedies can influence the course of the disease in the slightest. Admissions of this kind do much to stimulate the investigation of those hopeless diseases against which our present knowledge cannot prevail.

Kala-Azar.

A Handbook for Students and Practitioners. By L. Everard Napier, M.R.C.S., L.R.C.P. Lond., in charge of Kala-azar Research, Calcutta School of Tropical Medicine; and Ernest Muir, M.D., F.R.C.S. Edin., of the Calcutta School of Tropical Medicine. London: Humphrey Milford. Oxford University Press. 1923. Pp. 160. 8s. 6d.

This handbook represents an elaboration by Dr. Napier of a somewhat similar, but smaller, volume written by Dr. Muir several years ago. The objects of the present volume are twofold: to record briefly and concisely the facts of the disease as at present known and to indicate the lines on which future research should be conducted, especially as regards the transmission of the disease. The three principal foci of the disease in India are Assam, Bengal, and Madras; on the other hand, Burmah, Ceylon, Bombay, the Punjab, and the N.W. Frontier Province have only recorded imported cases. To all intents and purposes, though the disease occurs in other parts of the tropics and subtropics, kala-azar is essentially an Indian disease, and its complete elucidation a matter of primary importance to that country. This book, then, fulfils an admirable purpose in setting forth succinctly all that is known about the disease as it occurs in India. The section dealing with the pathology of the blood, describing the formaldehyde test, or the formol-gel reaction, which may be taken as absolutely diagnostic of kala-azar, is specially to be commended. Spleen puncture is regarded as a perfectly safe operation, we are glad to note, but there appears to be nothing to recommend sternum puncture as a means of investigating the bone-marrow with a view to diagnosis. The clinical descriptions and the methods of treatment are particularly complete and are, therefore, welcome to the sincere student of tropical medicine. While strongly advocating the specificity of antimony tartrate in this disease, the authors are careful to express the opinion that finality has by no means as yet been reached, and that the future is dependent upon investigations upon the pharmacology and biochemistry of the antimony salts. In regard to these aspects of treatment little, if any, investigation has as yet been attempted.

THE new edition of Delafield and Prudden's "Text-book on Pathology," reviewed last week in this column, is published in England by Messrs. John Bale, Sons and Danielsson, Ltd.

JOURNALS.

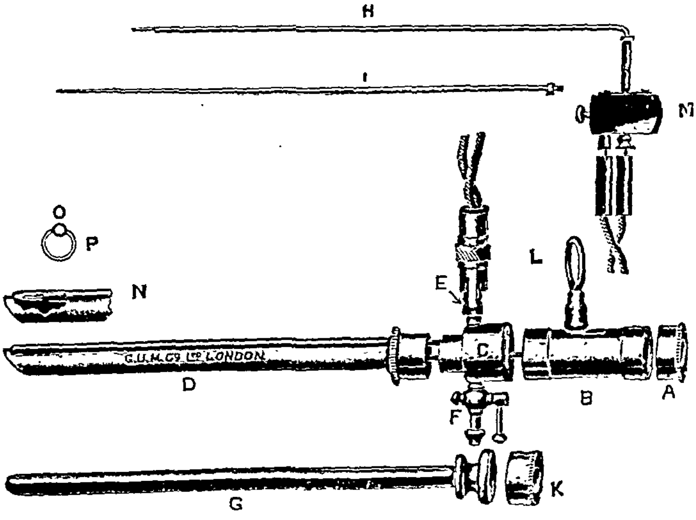
BRAIN. Vol. XLVI., Part 1.—On Certain Tonic or Postural Reflexes in Hemiplegia, with Special Reference to the so-called "Associated Movements," by F. M. R. Walshe. Continuing his brilliant researches into the phenomena of hemiplegia the author analyses a series of cases showing the so-called "associated movements." He concludes that they are tonic or postural reflex actions allied to the tonic neck and labyrinthine reflexes of Magnus and de Kleijn. They are best elicited by tonic voluntary activity of the normal limbs, and in these circumstances may be described, following Magnus's nomenclature, as "tonic reflexes arising in the limbs and acting on the limbs." The point illustrated by associated reactions, whatever their place of origin and seat of response, is that while the tone of a given muscle depends primarily and essentially upon the integrity of its own afferent supply, yet this tone is constantly influenced and modified by impulses arising in proprioceptive end-organs elsewhere in the body.—The Oculomotor Nucleus of Tarsius and Nycticebus, by John I. Hunter. They exhibit the presence of a central nucleus of Perlia which is smaller than in the anthropoidea. The Edinger-Westphal nucleus is in each case single; it is also concluded that relatively few optic fibres fail to cross in the optic chiasma. These differences from the anthropoidea are believed to indicate that stereoscopic vision has not yet been properly attained.—Lethargic Encephalitis and Herpes Febrilis, by Z. Szymanowski and Nathalie Zylberlast-Zand. By inoculation of the cornea of rabbits with material from the idiopathic herpes and from herpes associated with cerebro-spinal fever and scrofulosis the authors produce evidence to show that the pathological changes in the brain resulting therefrom are identical with those due to encephalitis lethargica. As a control other rabbits were inoculated with the virus of encephalitis lethargica itself. It is interesting to note that these observers found inflammatory changes in the liver in all their animals, whether inoculated with herpes or with encephalitis lethargica.—Dystrophia Myotonica (Myotonia Atrophica), by W. J. Adie and J. G. Greenfield. A brief review of the history of this disease is given together with a full description of an autopsy, believed to be the first to take place in this country, and a description of the disease based upon 20 cases observed by the authors. They conclude that dystrophia myotonica is a disease *sui generis* within the group of heredo-familial degenerative disorders. The fully developed disease is confined in the main to one generation (the dystrophic generation) where it occurs in some members of a number of families of the same child-rank to a common ancestor. In this generation some members remain healthy, some may have cataract alone, some may suffer from the disease in an incomplete form; whilst others present the combination of muscular atrophy and myotonia with certain extra-muscular symptoms for which the name dystrophia myotonica has hitherto been reserved.—Iron in the Brain, by A. Gans. A description is given of the various methods of obtaining the iron reaction in the brain together with some results obtained, with the object of directing attention to the importance of this promising method of research.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXVI., No. 3. July 1923. Pp. 305–432.—The Cultivation of Anaerobes in Auto-digest of Pancreas, by F. P. G. de Smidt. A medium made by incubating minced pancreas with chloroform for 24 hours gives free growth of anaerobes and other organisms and has a high concentration of amino-acids. Quantitative measurements of the relation of growth to reaction are given.—On Catalase in Bacteria and its Relation to Anaerobiosis, by A. B. Callow. Aerobes (except streptococci) have considerable amounts of catalase, anaerobes none. It is therefore possible that anaerobes fail to grow in the presence of oxygen because they are killed by the hydrogen peroxide which is then produced and not destroyed by catalase.—Bacterial Catalase, Anaerobes, and Oxygen, by J. W. McLeod and J. Gordon. In two papers the authors give much further information about the presence of catalase in and the production of hydrogen peroxide by a number of bacteria and suggest a classification based on these properties. In the presence of oxygen anaerobes produce hydrogen peroxide to which they are very sensitive. Ordinary media exposed to light are unsuitable for the growth of anaerobes and other organisms which are sensitive to peroxides owing to the development of traces of these substances in the medium.—Observations on Granules of Nucleolar Origin found in the Cells of Malignant Neoplasms during Mitosis, by H. A. Haig.—The Complement-fixation Test in Tuberculosis, by H. L. Coulthard. A thorough investigation of the various preparations of tubercle bacilli which have been used in the complement-fixation test leads the author to prefer simple suspensions of killed bacilli in saline. The reaction is highly specific, but is given by not more than 80 per cent. of cases of pulmonary tuberculosis and 50 per cent. of other forms. Acute infections generally give negative results and the strongest reactions are given by cases of chronic phthisis which are doing well; cases which are failing become weak or negative. The reaction therefore may be of some prognostic value.—The Glands of Internal Secretion in Experimental Avian Beri-beri, by V. Korenchevsky. Deprivation of vitamin B leads to hypertrophy of the adrenals, atrophy of the thymus, and atrophy of the splenic pulp: less constantly to activity of the thyroid, hypertrophy of the interstitial cells of the testis, and increase of the light cells of the pituitary.—The Influence of the Mother's Diet during Pregnancy and Lactation on the Growth, General Nourishment, and Skeleton of Young Rats, by V. Korenchevsky and M. Carr. Proper supplies of fat-soluble vitamin and calcium to the mother during pregnancy and lactation are most important for the welfare of the young.—Heteromorphosis (Metaplasia) of the Alimentary Tract, by G. W. Nicholson. The author describes gastric mucous membrane in a persistent vitelline duct, in Meckel's diverticulum, in a cyst of the pancreas, in inflamed gall-bladders, and in a tuberculous ulcer of colon. He points out that these abnormalities support an epigenetic mechanism of development and differentiation—i.e., environment determines which of the many potencies of cells shall be dominant.—Titration of Complement in the Wassermann Reaction, by F. C. Lewis. More delicate results are obtained by a finer gradation of quantities of complement than is generally used.—Bordet's Extract in the Wassermann Reaction, by H. D. Wright. Works as well as the more usual preparations, is stable and convenient.—A New Method of Decalcification, by C. Powell White. A solution of ammonium citrate, neutral or even alkaline, has no harmful effect on the tissues and leaves the staining unaffected.—Method of Mounting Museum Specimens, by G. S. Williamson and I. H. Pearse. Labels on thin celluloid mounted in gelatin.—" Minute Bodies " in Two Cases of Epidemic Encephalitis, by C. Da Fano. A further account of the occurrence of the stainable particles, possibly parasites, previously described by the author.—Pneumococcal Endocarditis in Rabbits, by W. Mair.—The Effect of the Individual Host on the Virulence of Pneumococci, by C. H. Browning and R. Gulbrausen.—On *Bacillus coli anaerogenes*, by D. Nabarro. An account of the occurrence, variation, and serological reactions of a number of non-gas-forming strains.—The Origin of the Mononuclear Phagocytes of the Lung, by D. F. Cappell. The phagocytic cells of the alveoli are at first derived from special areas of the alveolar epithelium and in the later stages of irritation from the endothelial cells in the alveolar walls.—Modification of Victoria Blue Method of Auglade and Morel for Neuroglia Fibres in Frozen Sections, by J. Anderson.—An excellent photogravure of the late Prof. James Ritchie, for many years secretary of the Pathological Society and editor of the journal, is issued with the present number.

New Inventions.

A NEW URETHROSCOPE AND ITS USE AS A VAGINOSCOPE FOR THE TREATMENT OF VULVO-VAGINITIS IN CHILDREN.

THOSE who prefer a light urethroscope with the lamp at the end of the cannula may be interested in a new pattern, which has the advantages that the lamp-stem cannot obstruct the field of view; the lamp-bulb is in a recess and does not shine into the observer's eye; the operating attachment is very light, easy, and precise in action, and the instrument, with electro-cautery attached, weighs less than three ounces. The cannula, D, shown in the figure, has its end bevelled, and the lamp-stem is carried in a special tube in the long side of the cannula as shown at N, the bulb being very close to the end so that it lies in a recess and shines across the field. After removal of the introducer, G, the lamp, carried on C, is passed down the side-tube, shown in cross-section at O P; and the diagnostic eye-piece, K, is fitted into C, which has on one side the electrical switch, E, and on the other the bellows attachment, F. The operative attachment, B, is very simple. It consists of an outer cylinder with a longitudinal slot in one side, up and down which the 'handle' of the instrument, L, can travel. In order to retain the air on inflation, the slot is covered by an internal cylinder fitting the outer one very closely. This internal cylinder has a short metal tube set in it at right angles to the long axis, so that it lies within the slot in the outer cylinder. Through the metal tube is passed the handle of the instrument, the stem of which is screw-threaded, as shown on I, so that it can be screwed into the head of the handle within the instrument. The whole is made airtight by a short piece of rubber tube, one end of which grasps the instrument handle and the other the tube through which this is passed. The electro-cautery is carried in the same way as the ordinary instrument and handle, the portion H being detachable from M, so that it can be passed up the inside of the operating attachment and fitted to the portion M, which carries the terminals and switch, and is fitted into the tube mentioned above in much the same manner as the ordinary instrument. A different eye-piece, A, is employed in the operative attachment, owing to the longer focus required. I have found the electro-cautery wonderfully convenient, as it is a very simple matter to bring the end into contact with any part required and then to turn on the current by pressing the button switch shown opposite to M in the diagram. This instrument with larger cannulas—namely, 28, 30, 32, and 34 F—is being used in the V.D. department at St. Thomas's Hospital for the treatment of vulvo-vaginitis in children. Evidence proves that one reason for the failure of ordinary methods of treatment of this troublesome complaint is that under the ordinary douching and swabbing which are usually employed the medicament does not reach infecting organisms in the fornices of the vagina.



The plan of treatment adopted, which has so far given very promising results, is to pass the largest cannula, with the introducer, which the hymen will allow. The introducer is removed, the lamp attachment inserted, and the vagina inspected under air inflation, as in ordinary urethroscopy. The view of the cervix and fornices which is obtained in this way is perfect. After this the outside of the cervix and the whole surface of the upper reaches of the vagina are painted with 25 per cent. mercurochrome 220. This can be done either by passing a dressed urethroscopic stick through the cannula after removing the eye-piece, or under air inflation by using the operating attachment and a dressed probe. Whichever method is chosen, the operation is not complete until every nook and cranny has been treated, as verified by inspection under air inflation. Care is taken that the dye does not reach down as far as the vulva in such strength: it will trickle down later, but will by then have become diluted. Naturally, the urethra and other infected parts must also be treated, but the method outlined above of insuring that every part of the vagina is reached by the chosen medicament seems rational, and the results have certainly been most encouraging. So far only mercurochrome has been tried; doubtless a large array of other drugs will suggest themselves to workers in this field.

The instrument has been made for me by the Genito-Urinary Manufacturing Co., 66, Margaret-street, London, W. 1.

L. W. HARRISON, D.S.O.,
Colonel, R.A.M.C. (ret.).
St. Thomas's Hospital, S.E.

FROM the list of Birthday Honours which appeared in THE LANCET of June 9th was accidentally omitted the name of Lieut.-Colonel T. R. St.-Johnston, C.M.G., who was a medical officer in Fiji for over ten years, and is now Colonial Secretary of the Leeward Islands. His "South Sea Reminiscences" were recently reviewed in our columns.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the principal health statistics of a group of county and rural districts for 1922 :—

District.	Estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Hertfordshire ..	334,706	17·4	10·7	0·7	1·3	2·3	52	129	4·5
Herefordshire C.D.	50,523	20·4	15·4	1·2	1·1	3·2	56	93	2·0
West Gloucestershire C.D. ..	48,059	21·2	11·9	0·7	1·0	2·9	55	132	3·0
Dumfries County (landward) ..	43,808	24·0	14·3	1·0	1·2	1·9	—	—	3·8
Doncaster R.D.	27,300	29·9	12·2	1·1	0·9	2·3	93	222	4·8
Guildford R.D. .	20,090	17·5	11·4	0·7	1·5	1·5	33	111	0·0
Stockton R.D. .	15,150	25·0	10·6	0·3	0·8	2·6	91	222	2·6
Bridlington R.D.	8,154	18·6	12·0	0·4	1·0	1·9	32	136	6·8

C.D. = combined district. R.D. = rural district.

Hertfordshire.

Dr. H. Hyslop Thomson states that special efforts are made to deal with all open cases of tuberculosis in insanitary areas or in unhealthy or overcrowded houses. The opening of the County Sanatorium at Ware Park, with accommodation for 130, marks an important stage in the council's scheme. The absence of adequate accommodation for low-grade and complicated cases of mental defect is seriously felt from time to time. The need for a few efficient small-pox hospitals to take the place of the large number of existing small hospitals, many of which are of indifferent construction, is pointed out. Provision for the supply of diphtheria antitoxin is only made by about half of the 34 districts. The educational work of the "centres" has brought about a reduction in bottle-feeding, and the decline in notified cases of ophthalmia neonatorum is claimed to be the result of the use of colloidal silver by the midwives.

Dr. Thomson again complains of the dumps of imported refuse. The Ministry of Health has suggested rules to be observed by dumping authorities, but legislation will be needed to give the county council power to enforce these rules. One improvement has been brought about by the Ministry—namely, that railway wagons conveying refuse are required to be covered. The question is: Has any sanitary authority a right to create a dump for offensive refuse in the district of another sanitary authority, and has not sanitary science advanced sufficiently to enable us to say that these offensive refuse dumps are unnecessary? The purification of our rivers has cost money but has been worth it. We think the abolition of offensive refuse dumps will also be worth the cost.

Herefordshire.

Dr. Herbert Jones complains that the district councils do not take the water-supply of the houses in their districts seriously. About one-quarter of the cottage houses are supplied from sources at a distance and many dip wells which could be rendered safe are not rendered safe. It is also quite common to build a new cottage before ascertaining whether there is any suitable water-supply available. Dr. Jones has no sympathy with any occupier who complains that his pail closet is a nuisance. The remedy is in his own hands—viz., to see that a supply of earth is provided and used. There is a great improvement in the sanitary arrangements of the licensed houses. A few years ago it would have been difficult to find a house where one could recommend a fisherman or tourist to stay for a week-end. Now there are many comfortable country inns with sanitary conditions equal to those in towns.

Owing to the cost of repairs, routine house inspection has been in abeyance. Dr. Jones recommends that it be resumed. Thirty-six new houses were completed during the year. The accommodation for hop-pickers has been greatly improved in those districts in which by-laws are in force. Of the six rural districts in the combined district, one does not import hop-pickers but five do. Of the five councils of the districts which need to import hop-pickers, three have adopted by-laws but two have not. Dr. Jones points out that many of the hop-growers are anxious to make the pickers comfortable and that it is unfair to them that other growers do not "toe the line." The by-laws are not exacting, and one hopes that before the next report is issued the two reluctant rural district councils will have adopted them.

West Gloucestershire.

Surg.-Captain O. W. Andrews reports that the new reservoir on Ruardean Hill, the highest point in the Forest of Dean, has been completed, and that improved machinery for deep well pumping is being established at Greenbottom and will be ready for use next summer. Further extensions proposed will, it is hoped, provide a satisfactory supply for the whole of East Dean. An unusual incident is reported in the sudden disappearance of the water in three wells supplying the residents of Plump Hill Ward, East Dean. Earthquake disturbance could apparently be excluded, and it is suggested that the occurrence is due to the driving of an adit by an iron ore company under the area affected. There is a good spring in the neighbourhood, and it is suggested that this should be used to supply a ram capable of pumping the water to a reservoir on high ground, from which the whole district can be supplied at small cost. Dr. G. F. Rigden, the medical officer of the Cinderford Mothers' Club and Babies' Welcome, referring to industrial depression, says there are not an unusually large number of cases of malnutrition, but that he has been many times struck by the evident signs of under-nourishment in the mother of a well-nourished child.

Dumfries County.

Dr. J. Maxwell Ross reports that there were 936 legitimate and 116 illegitimate births in the County Landward. The mortality is not given for legitimate and illegitimate infants separately. The total rate per 1000 births was 85, the male rate being 97 and the female 71. Dr. Ross reviews the tuberculosis scheme; 27 shelters are available for use throughout the county. Sanatorium accommodation is very limited, especially for surgical tuberculosis cases, which need such prolonged treatment and for whom successful domiciliary treatment is impossible. The disposal of sewage by the burghs and special drainage districts is not yet satisfactory. In one case the difficulty is the cost to a village with a low rateable value. The pollution of the Nith by black water, apparently pumped from the coal-mines, and also by lead from Wanlockhead lead-mines has received attention. The question has arisen as to whether the former pollution can be dealt with under Section 5 of the Rivers Pollution Prevention Act, 1876.

Doncaster Rural.

Dr. A. B. Dunne reports marked building activity in five of the 37 parishes included in his district. The sinking of the shaft of the new colliery at Armthorpe has been actively carried on; 472 new dwelling-houses and bungalows have been completed during the year.

Guildford Rural.

Dr. R. W. C. Pierce reports a considerable prevalence of influenza in the early part of the year and that schools had to be closed for this cause. The new slaughter-house by-laws have come into force and make provision for the humane method of slaughter. The 112 new houses completed during the year include 50 erected in Artington parish by Onslow Village, Ltd., now absorbed into the borough.

Stockton Rural.

Dr. Thomas J. Kirk reports a slight influenza epidemic in the last month of 1921 and the first month of 1922. The number of new houses completed during the year was 96, all by private enterprise.

Bridlington Rural.

Dr. William A. Wetwan reports that a few houses have been built but not enough to warrant turning out the occupants of 40 to 50 dilapidated dwellings and putting pressure on the owners of many more to bring them up to date. This is Dr. Wetwan's farewell report after 31 years' service, and he makes reference to the sanitary improvements which have taken place in the district during that period.

SCHOOL MEDICAL SERVICE.

Bristol.

Last year 28,132 children were medically examined; 16,248 of these were routine, and 11,884 special inspections. Of the 1165 children suffering from enlarged tonsils and adenoids, 984 were recommended for treatment. 497 new cases were examined at the tuberculosis dispensary, and of these 57 were classified as definite pulmonary tuberculosis, 212 as cases of involvement of the hilar glands, &c., 20 as suspected tuberculosis, 208 as non-tuberculous. There were 295 cases of scabies, 2358 of impetigo, and 418 of ringworm of the scalp dealt with during the year; 183 of the ringworm cases were carried over from last year. Most of the 1050 cases of external eye disease occurred amongst debilitated children from the poorer homes. Attendances at school clinics during the year amounted to 172,487. A campaign was initiated in 1921 against verminous conditions. The coöperation of teachers, health visitors, infant welfare centres, schools for mothers, Sunday schools, boards of guardians was enlisted. Dr. R. A. Askins reports that a very great amount of good has resulted. He considers that if public interest can be kept stimulated in this problem we may soon see this evil reduced to such dimensions as to make its final extinction possible. Open-air classes are held in three city parks, each class accommodating 25 children. In wet weather the bandstands, protected by canvas wind-screens, are utilised, and the attendance at these classes rarely drops below 90 per cent.

Colchester.

The total number of children examined under the routine group was 2134, and 47·2 of these had defects requiring treatment or further observation; cases of uncleanliness or dental defects are not included. The number of children with defects is lower than that of the previous year, and Dr. W. F. Corfield observes that there appears to be only one reason to account for this—"the surplus of defects that had become chronic during the war and also the cases of malnutrition and debility resulting therefrom have now been overtaken, and the above figures are somewhat about a normal return." But surely the remarkable effect of the war on school statistics all over the country was the decrease in the number of cases of malnutrition and the feeding cases. The class for stammerers held last year has not yet been resumed, and the children returned to their ordinary schools. The teacher in charge of the class visited these schools and reported on the condition of the children. Of the 37 who attended the classes, two left the town and ten left school. The head teachers, with one exception, agreed as to the great improvement in speech effected by the classes, and an effort is made to keep up the practice of voice exercises. Of the 1580 children referred for treatment, 728, or less than half, actually received treatment.

At present little attempt is made to encourage parents to send or bring children to the dental clinic, as the dentist has his time fully occupied with those who come without such pressure. The medical officer suggests two methods by which this lack of interest could be stimulated: (1) the services of the dentist be secured for an extra half day a week; and (2) a dental dresser be employed to help the dentist. As it is, the dentist was employed on fewer occasions during 1922 than 1921, and we would suggest that in medical treatment of school-children, as in everything else, the demand creates the supply rather than vice versa. In this borough the demand appears to require energetic stimulating.

Swindon.

Altogether 3697 inspections were made. Of the 2673 children examined in the routine group, 45 suffered from malnutrition, 73 from defective hearing, 2 from otitis media, 55 from other ear affections, 13 from scabies, and 25 from speech defect. During the year there were 227 cases of ringworm, which has been prevalent in Swindon for many years. The work of stamping out this disease is now well in hand, and at the end of the year there were only 23 cases in an infectious condition, and every case was under treatment.

The prevalence of thyroid enlargement in Swindon led to the establishing of a clinic to deal with this affection, and Dr. Dunstan Brewer reports on the result of a year's treatment of those cases who were handicapped either by the appearance of the enlargement or by symptoms of disordered thyroid action. At first the cases were treated by simply painting the neck with tincture of iodine, and a definite improvement in these cases is recorded. On the assumption that the improvement was not due to any local action but to the absorption of iodine, a second batch of cases were painted under the armpits instead of on the neck. A more rapid improvement is recorded in such cases. A third batch was treated with iodide of potassium given internally with no apparent improvement of any description. Collosol iodine given internally proved to act better than any other treatment, and is now the standard method employed. The statement in the report that methods of treating stammering and similar defects of speech at present available in this country are of no practical utility, as they entail a cost which neither parents nor ratepayers are prepared to face, is surely inaccurate. We would refer Dr. Brewer to the six London County Council clinics for such treatment, which have been doing excellent work in this direction for the last two years, and can certainly not be called expensive.

THE PASTEURISATION OF MILK.

A REPORT BY THE MINISTRY OF HEALTH.

In a recent report which constitutes one of the Ministry of Health series of reports on public health and medical subjects, Dr. J. M. Hamill[1] gives a brief account of the nature and object of pasteurisation, and the part which it may legitimately play in securing a safe and satisfactory milk-supply. His notes are also intended to serve as a guide to local authorities and others in respect of essential requirements in the design and construction of pasteurising appliances which should be complied with in order to satisfy the provisions of the Milk (Special Designations) Order, 1923, in regard to pasteurised milk.

Definition.

At the outset Dr. Hamill defines the object of the pasteurisation of milk as the destruction by heat of pathogenic organisms, and the reduction of the number of other organisms, especially those which cause milk to go sour, without appreciable alteration of the physical and chemical characters of the milk. When milk is heated to a relatively high temperature such, for instance, as 175° F. to 212° F. pathogenic organisms may or may not be destroyed, according to the actual temperature attained and the duration of exposure of the milk to it; in any case the physical and chemical properties of the milk undergo considerable alteration as a result of such treatment, and from a commercial point of view the quality and saleability of the milk is impaired. It is also possible that from a nutritive point of view such milk is less desirable than milk not so treated. Experience has shown that exposure of milk to a temperature between 145° F. and 150° F. for 30 minutes, if carried out with due attention to detail, destroys virtually any pathogenic organisms present in the milk without producing appreciable change in its physical and chemical characters. From the public health point of view, therefore, where milk is concerned, the term "pasteurisation" should be confined to the process of heating to not less than 145° F. and not more than 150° F. for a period of 30 minutes. Dr. Hamill uses the term strictly in this sense.

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[1] Reports on Public Health and Medical Subjects. No. 17: Notes on the Pasteurisation of Milk. By J. M. Hamill, M.D., D.Sc., Medical Officer of the Ministry of Health. 1923. 2*d.*

Effect of Pasteurisation on Bacterial Content of Milk and on its Chemical and Physical Characters.

Amongst the pathogenic organisms with which milk may be accidentally contaminated are *B. tuberculosis*, *B. diphtheriæ*, *B. dysentericus*, *B. typhosus* and other organisms of the typhoid-paratyphoid group. All the above organisms are destroyed by pasteurisation; the virus of foot-and-mouth disease is also destroyed, and although a small proportion of tubercle bacilli may, under certain conditions, escape actual destruction, their virulence appears to be so impaired as to make them harmless. Certain strains of streptococci may also survive pasteurisation, but the streptococci believed to be responsible for septic sore throat are destroyed by the process. Pasteurisation, therefore, renders milk reasonably safe as regards risk of transmitting disease. But apart from pathogenic bacteria milk always contains a number of non-pathogenic bacteria which gain access from the hands of milkers, from particles of manure, from dust and dirty utensils, &c. The number of these bacteria, quite apart from their pathogenicity, indicates the care bestowed upon its production and handling. Dirty milk is, of course, more likely to contain pathogenic bacteria. A proportion of the non-pathogenic bacteria are sporing organisms; amongst them are lactic acid bacteria which produce lactic acid during their growth and cause the souring of milk.

Pasteurisation does not destroy the whole of the non-pathogenic organisms in milk, but may reduce their number by as much as 99 per cent. As a general rule it may be said that the number of bacteria after pasteurisation is greater in milk which contained a large number of bacteria before pasteurisation than in milk which originally contained relatively few bacteria. Thus the bacterial content of pasteurised milk affords an indication of the bacterial condition of the milk before pasteurisation.

When milk is properly pasteurised the majority of its chemical and physical characters show no appreciable change. The taste and flavour are hardly if at all altered; alteration in the taste of the milk may depend, to some extent at any rate, upon exposure of the milk to air at the pasteurising temperature—in other words, oxidation may play a part in the change. If this be so the desirability of avoiding so far as possible exposure of milk to air during pasteurisation is obvious. If ordinary raw milk is allowed to stand, the cream gradually rises to the top and a line of demarcation, the "cream line," appears between the cream and the remainder of the milk. In milk pasteurised at 145° F. for 30 minutes the cream line is hardly if at all affected, but above that temperature the cream rises slowly and imperfectly, and in milk pasteurised at a temperature of 148° F. the cream line may be decreased by 40 per cent. From a commercial point of view the integrity of the cream line is important, because consumers are apt to look askance at milk in which the cream line is poor. In milk pasteurised at 145° F. for 30 minutes no appreciable change takes place in the milk proteins: if, however, the temperature is raised to 150° F. for 30 minutes a small proportion (about 5 per cent.) of the milk albumin is rendered insoluble. Coagulation by rennin occurs slightly more rapidly in pasteurised than in raw milk. The soluble calcium and magnesium phosphates of the milk do not become insoluble or separate out when milk is pasteurised at a temperature of 145° F. for 30 minutes. This treatment has, furthermore, only a slight effect upon the enzymes which are present in milk.

The effect of pasteurisation on the vitamins in milk is important. Milk is rich in fat-soluble A vitamin and also contains water-soluble B vitamin and the antiscorbutic vitamin (or C vitamin). Both fat-soluble A vitamin and water-soluble B vitamin have a relatively high resistance to heat, so that pasteurisation has practically no effect upon them. The antiscorbutic vitamin, however, is sensitive to heat above 122° F. and there seems to be little doubt that pasteurisation at 145° F. for 30 minutes weakens the antiscorbutic property of milk. The destruction of vitamins appears to be due to oxidation and is accelerated in the presence of air. Any precautions taken in pasteurisation to exclude air with the object of preventing changes in taste and flavour would also act beneficially in safeguarding the vitamins.

Some Considerations in Regard to Pasteurisation.

In general it is desirable that food should be consumed in its natural fresh condition whenever possible, but in densely populated areas the circumstances are often such that, unless perishable food like milk can have its keeping qualities improved by some process which does not appreciably alter its properties or impair its nutritive value, a proportion of the population will be forced to curtail or even do without a very important food.

An ideal milk-supply, obtained from perfectly healthy cows under the cleanest conditions and consumed immediately with the least possible manipulation or handling, is difficult of attainment. Milk of this high quality must necessarily be limited in amount and its cost precludes its use by the average consumer. As England is a highly urbanised country, much of the milk-supply has to be transported considerable distances, a circumstance unfavourable to its keeping qualities and often resulting in considerable loss of milk by souring. Pasteurisation may be regarded as a factor in the extension of the consumption of milk by urban dwellers, many of whom at the present time do not consume as much milk as they should. Pasteurised milk is, of course, just as liable to bacterial contamination as clean raw milk, and since it still contains some lactic acid producing organisms it will eventually go sour just as does clean raw milk. It is essential, therefore, that it should be thoroughly cooled immediately after pasteurisation and kept under good conditions until consumed.

It is sometimes asserted that bacteria grow faster in pasteurised than in raw milk. Experimental evidence, however, does not bear this out, but goes to show that the rate of bacterial increase is approximately the same in raw and pasteurised milk when comparison is made between milks having about the same bacterial content. It is also alleged that pasteurisation will not encourage farmers to exercise cleanliness in production of milk, and will enable dirty and stale milk, otherwise unfit for sale, to be placed on the market. But the keeping qualities of pasteurised clean milk are superior to those of dirty milk after pasteurisation. It is, of course, possible to prolong the life of pasteurised milk by repasteurisation, but this process would permit deviations from the normal to an extent which is undesirable.

It is occasionally stated that pasteurised milk does not agree with all children, but the same may be said of any milk; extensive experience of feeding children on pasteurised milk goes to show that it is as well borne by them as raw milk, and, except in regard to antiscorbutics, it appears to be equally nutritious.

Appliances Employed in Commercial Pasteurisation.

A pasteuriser should be moderate in cost, reliable, efficient, simple, compact, durable, easily kept clean, easily operated, and, in addition, continuous in action. A large variety of appliances continuous in action have been devised for commercial pasteurisation. They can conveniently be grouped into four categories or types.

1. "*Flash*" *Pasteurisers.*—"Flash" pasteurisation is a process in which the milk is very rapidly heated to a relatively high temperature and then cooled. In one type of flash pasteuriser the milk enters a hollow vertical cylinder at its lower end and by means of a rotating device is distributed by centrifugal force in a thin film over the inner surface of the cylinder and then leaves the cylinder at its upper end. The cylinder, and therefore the milk flowing over its inner surface, is heated by a combined water and steam jacket. The apparatus is continuous in action. This type of pasteuriser has many serious disadvantages. It is very difficult to maintain a uniform temperature, and the relatively small heating area makes it necessary to raise the temperature of the heating medium considerably higher than the temperature to which it is desired to raise the milk. This means overheating of portions of the milk and alteration of its character. Again, the milk is not retained sufficiently long at the pasteurising temperature and portions of the milk may not reach that temperature. It is impossible by means of a "flash" pasteuriser to ensure the definite results aimed at in pasteurisation.

2. "*Retarders.*"—The many varieties of design in this class of pasteuriser agree in the general principle of allowing the milk to pass through an apparatus so constructed as to delay or retard the flow of the milk and thus keep it at the pasteurising temperature for a prolonged period. All retarders are continuous in action. Retardation may be effected by various devices, such as compelling the milk to take a long course through a series of tubes or through chambers fitted with baffle plates. Where it is required that milk shall be exposed to the pasteurising temperature for 30 minutes the apparatus is so designed that a volume of milk equal to the capacity of the apparatus passes through it in that time.

Retarders possess many commercial advantages—simple design, close control of temperature, &c., but for complete destruction of pathogenic organisms retarders cannot be relied upon, as no retarding system yet designed is able to prevent a portion of the entering milk from passing through in less than the prescribed time.

3. "*Holder*" *Pasteurisers.*—The term "retarder" is sometimes used to describe pasteurisers of this class. It is desirable to restrict the term "retarder," however, to appliances of the type described above. The "holder" class of pasteuriser has for its object the elimination of the defect which retarders possess of allowing a portion of the milk which passes through them to escape too soon. It is the practice commercially to classify holder pasteurisers into two groups, according to whether the milk is heated in the holder itself or before entering the holder. The underlying principle of holding all the milk at a definite temperature for a definite time is the same in both groups. The simplest form of holder is a tank in which the milk is kept or "held" at 145–150° F. for 30 minutes and then cooled. Holders of this type having a capacity of 50 to 100 gallons are made for dairymen doing a limited trade in pasteurised milk. The holder is conveniently a cylindrical tank surrounded with a water jacket into which steam can be admitted to heat the milk, and an agitator is provided in the holder to facilitate the heating of the milk. The temperature in the jacket is raised slightly above the pasteurising temperature by the admission of steam into the water, and when the milk in the tank reaches the pasteurising temperature the steam is cut off and the milk kept in the holder for 30 minutes, when it is cooled by a flow of cold water through the jacket. Alternatively, the milk may be heated before admission to the holder and cooled in a separate cooler after being held at 145–150° F. for 30 minutes. This simple type of holder is effective, but is not continuous in action; for work on a large scale continuous action is a commercial necessity, and the simplest way in which this can be attained is by using three separate holding tanks of the same capacity. Milk is held in one tank at the pasteurising temperature for 30 minutes, whilst the second tank is being filled and the third emptied. The milk in the second tank is then held for 30 minutes whilst the first tank is being emptied and the third filled; in this way a continuous cycle of filling, holding, and emptying is achieved. The use of only three tanks, however, is open to the objection that some of the milk may be held for much longer than 30 minutes, and that one hour must elapse after the commencement of work before pasteurised milk can be obtained. These drawbacks can be minimised by increasing the number of tanks and so enabling the period of filling and emptying each to be diminished.

To enable the process of pasteurisation to be adequately controlled and supervised, it is desirable that all pasteurisers should be fitted with some form of automatic time-temperature recorder, whereby the temperature of the milk during the process of pasteurisation in relation to the time taken is continuously recorded on a chart. A permanent record of this kind is of value to the milk vendor and to those in charge of administration as a check on the proper working of the pasteuriser.

4. *Pasteurisation of Milk in Bottles.*—The advantages claimed for the pasteurisation of milk in air-tight stoppered bottles are that the milk cannot become contaminated after pasteurisation and before use, and that it keeps longer than milk pasteurised in bulk. An apparatus for pasteurising milk in bottles cannot be regarded as satisfactory unless it can readily comply with the following requirements. It must be possible to ensure that the milk reaches the pasteurising temperature and is not heated above this temperature (145–150° F.), and in addition, there must be practicable means for ascertaining definitely that the milk has been kept at the pasteurising temperature for 30 minutes.

As regards the first requirement, the temperature of the heating medium (usually water heated by steam) may be considerably above the pasteurising temperature, and there are obvious difficulties in making certain that the bottled milk, the temperature of which cannot be measured directly, has attained and not exceeded the pasteurising temperature. Similar considerations apply to the second requirement. It is not a simple matter to ascertain the period during which the milk has been kept at the pasteurising temperature in the case of milk in bottles, where direct temperature measurement is impossible. The matter is complicated by the period, not easily estimated, during which the temperature of the milk in the bottle lags behind that of the heating medium. In any particular apparatus this period of lag might be ascertained experimentally, and possibly an apparatus could be designed in which it would be small, but for purposes of control and supervision a method in which the period of exposure to the pasteurising temperature can only be determined indirectly is not so satisfactory as methods in which direct observation is possible. Uncertainty could be avoided by first heating the milk in bulk up to the pasteurising temperature, and then filling the bottles already heated to the same temperature and keeping them at that temperature in the pasteuriser for 30 minutes. This method would be similar in principle to that employed in the "holder" process for milk in bulk.

Donations and Bequests.—The late Mrs. Fredericke Mond, of Regent's Park, London, widow of Dr. Ludwig Mond, left to all the charitable societies or institutions to which she had been an annual subscriber for at least two years before her death a legacy, free of duty, equal to the aggregate amount of her annual subscriptions for the last eight years.

THE LANCET.

LONDON: SATURDAY, AUGUST 18, 1923.

LONDON WATER.

THE Metropolitan Water Board supplies 35 gallons of water a day for the use of each of nearly seven million persons scattered over 537 square miles and six counties, water which is fit not only to wash and flush, but to drink; and this immense task is carried out with such apparent ease and regularity that the Londoner, when he travels, begins to realise for the first time that water may be scanty or brackish or insipid or discoloured. It was only during the great drought of 1921 that the inhabitants of the metropolis began to think seriously at all of their water-supply, and Sir ALEXANDER HOUSTON, director of water examination to the Board, in his seventeenth annual report just published,[1] endeavours to keep alive this new and wholesome interest by describing the wonders of London's water-supply in language as free from technicalities as is reasonably possible. The complete protection of London from water-borne disease is the more remarkable inasmuch as 80 per cent. of the water is drawn from two rivers which are undeniably polluted. Less than 20 per cent. comes from the deep wells in Kent and in the Lea valley, whose water is bright, clear and sparkling, and pleasant to taste, while its undoubted hardness is not prejudicial to health although prodigal of the use of soap. Its reputation for purity is almost a danger, apt, as it is, to create a feeling of implicit trust, and during the drought of 1921 the Deptford "twins" well fell off so greatly in quality as to require chlorination. Another well, that at Waltham Abbey, supplies water which, although very pure bacteriologically, contains iron and sulphuretted hydrogen, which need to be eliminated. Although London well water bears such a small proportion to the whole, we are reminded that it would abundantly supply a city of the size of Birmingham.

Pollution of the river water-supply is not a fixed or necessarily permanent quality. The Thames used to be a great salmon river, and might be so again were it not for the effluents draining into the tidal portion. Salmon could now thrive and spawn in the river above Teddington weir, although they cannot face the ordeal of ascending the lower reaches, and the upper Thames as it is possesses great powers of recuperation, for the surface water is constantly being replenished by underground springs, and during the summer months many of the existing pollutions cease to reach it direct. Investigations made 15 years ago showed the water at Hampton to be not greatly inferior to that 55 miles higher up, the difference being so slight as to suggest that in spite of fresh pollutions the river is not deteriorating to any progressively marked extent along its flow. Next year the total capacity of the Thames storage will be doubled on the completion of the great reservoir at Littleton. Storage is one of Nature's own methods of purification, by which not only do the solid impurities settle and chance pollutions become greatly diluted, but pathogenic bacteria gradually lose their vitality and die during the passage of water through the reservoirs. And these reservoirs are so enormous—taken together exceeding Ullswater in surface—that to all intents and purposes Londoners are really drinking lake water. Economy alone has led to the chlorination of raw Thames water in the aqueduct at Staines, by which a certain amount of additional pumping is avoided, and this chlorination has been carried out without giving rise to a single complaint of taste among the two million persons who drink it.

The Lea valley supply has peculiar interest, derived as it is largely from the New River, an artificial channel nearly 30 miles in length, with its intake safely above the Hertford sewage works. This rivulet is practically free from pollutions along its whole course, but has troubles of its own, for in the spring of each year abundant growths, chiefly of diatoms, develop to such an extent as to block the filters, and while such algicidal agents as chlorine or copper sulphate have been sometimes effective in the reservoirs, no panacea has yet been discovered for the prevention of algal troubles. New River water is continuously diluted as it flows with pure well water, and its volume would suffice to supply such a town as Liverpool or Manchester. Sir ALEXANDER HOUSTON is rightly proud of the results of the water examination which he directs, but his pæan of praise for the present supply is not, as he cannily remarks, to prejudice him in calling attention now or hereafter to any imperfections which may be found in the quality of the water. With whatever care and foresight, the water expert cannot discover all the hidden dangers to which a water-supply of this magnitude may be exposed. Safety lies in not introducing any new factor into waterworks procedure until it has the hall-mark of bacteriological approval, and in safeguarding the finally purified water against the entrance of impurities. The coöperation of the public is needed to achieve the second of these objects, and such a report as the one before us should help in forming and instructing public opinion. Let every good citizen read it.

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THE TREATMENT OF INFECTIONS OF THE HANDS.

IT would have been difficult to select a subject of more general interest than the treatment of infections of the hand, which was discussed at the annual meeting of the British Medical Association at Portsmouth. For this reason we gave last week an unusually long report of this session of the Surgical Section. It is probably within the mark to state that five-sixths of the adult working population follow some calling for the proper performance of which the integrity of their hands is a necessity. The importance of skilful initial treatment when these infections occur can scarcely be overestimated, for although the loss of one finger in itself may not interfere seriously with a man's occupation, when such an amputation must be resorted to the inflammatory process has too frequently spread to the palm, with the result that the grip of the hand or the movements of the other fingers are seriously impaired. In some hospitals the treatment of these patients from time immemorial has been relegated to the junior staff. The outcome of this policy has been that little interest has been taken in improving therapeutic technique, and a generation of practitioners has grown up trained in methods which are now obsolete.

It was left to KANAVEL in America to reinvestigate this subject and to infuse new life into it. The results of his labour were finally embodied in a monograph which will assuredly remain a classic upon which future treatment will be based. Although much of KANAVEL'S work was published more than ten years ago, his teaching has not yet reached the majority of general practitioners, so that we still see patients who have suffered from the commonest of all hand infections, that of the pulp of the finger, crippled by an ill-chosen median incision. Either there remains a scar too sensitive to pressure for use, or deforming scar-tissue has destroyed the delicate tactile sensibility of the pulp. Early lateral incisions are just as effective in checking the infective process without these drawbacks. The unsightly nails we still see after the healing of a whitlow result from delay in removing the nail and the unnecessary incision of the matrix. When the infection has reached the tendon sheath the prognosis as regards future mobility is rather poor, for the tendon is very likely to slough or form such adhesions that it becomes immovably fixed, whilst extension to an interphalangeal joint will almost certainly lead to a stiff finger. Here early lateral incisions are essential, but though they may pass with advantage through the subcutaneous tissue along the whole length of the finger, the sheath should only be opened opposite the shafts of the phalanges, or a troublesome prolapse of the flexor tendons will occur. The after-treatment of these thecal whitlows is exceedingly difficult and an issue with good movement is the exception rather than the rule. Sir Henry Gray's recommendation that Willems's mobilisation treatment should be instituted from the first deserves attention. After the incision the patient must be encouraged, threatened, or cajoled into active movements whilst his hand remains in a bath of weak antiseptic or saline solution. Passive movements are wrong and do harm. Drainage by this method is good. Tubes, gauze, or rubber tissue drains are seldom necessary. The worst of all infections are those which travel up from the thumb or little finger to the anterior carpal sheath. The operative treatment of this condition is a major surgical procedure and should always be carried out very deliberately under general anæsthesia, with a tourniquet applied. The areas of infection must be reached by the proper anatomical route, injury to the nerves and vessels of the palm being sedulously avoided. Even with the greatest care, the infective process may spread to the fascial planes of the forearm, and the general condition of the patient be so grave that an amputation becomes the only life-saving operation.

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[1] London: P. S. King and Son, Ltd., 2, Great Smith-street, Westminster. 15s.

Mr. D. P. D. Wilkie called attention to those streptococcal infections which show such a great tendency to generalisation. With a non-suppurative limited area of infection in the hand are associated a lymphangitis up the arm, an axillary adenitis, and septicæmic symptoms. Early incision is not indicated in this condition, the principles of treatment being to aid the general resistive powers of the body, encourage elimination, and locally to institute Bier's hyperæmia.

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DOCTORS AND UNCERTIFIED MIDWIVES.

A case of some interest, decided earlier in the year but only lately appearing in the Law Reports, throws light on the amount of supervision which a doctor should exercise over a woman who acts as a midwife without being certificated. The Midwives Act of 1902 declares that, if a woman is not certified under the Act, she commits an offence punishable by fine if she "habitually and for gain" attends women in childbirth "otherwise than under the direction of a qualified medical practitioner." An exception is made for emergencies, but in the case to which we draw attention (Davis *v.* Morris, *Law Times Reports*, vol. cxxix., p. 88) there was no suggestion of an emergency. The facts were that five expectant mothers had engaged an uncertified midwife's services; qualified medical practitioners were also retained in each case, but they did not pay any professional visits until after the confinements which were attended by the woman alone. In these circumstances she was prosecuted under the section. The doctors who had been retained came and gave evidence on her behalf. They said she was in their opinion capable and trustworthy; they had given her no specific instructions; it was unnecessary to do so; she was acting, they said, under their direction in attending the confinements. The magistrates had to consider whether this was sufficient supervision under the Act, or whether "direction" did not mean special instructions suitable to the particular case. They came to the conclusion that no offence had been committed and they dismissed the prosecution. It turns out, however, that they were wrong. The Lord Chief Justice pointed out that in no case was there any professional visit by the doctor; in no case was there any professional inquiry or any specific instruction. There was thus no evidence on which the magistrates could find that there had been any direction at all. Direction must be real and not nominal. "The medical practitioner should accept more than the nominal responsibility for the case. He must make himself acquainted with the particular requirements of the patient. It is not enough that there should be a qualified figure-head in the background; the unqualified person must be acting under the real direction of a medical practitioner."

This judicial homily deals, we take it, not so much with the abstract standard of doctors' conduct as with the conditions necessary to be established in a court of law if an uncertified midwife is to be found not guilty of an offence against the Act. But as there is no statutory definition of "direction," the decision is valuable. It is only fair to add that the woman whose action was in question had formerly been a certified midwife, but her certificate had been withdrawn. In the eye of the law she may have been uncertified and unqualified, but the skill and experience which in time past had been sufficient to earn her certification were, doubtless, well known to the doctors under whom—if not under whose "direction"—she was serving.

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ALTERATIONS OF VIRULENCE BY PASSAGE.

It is commonly held—and on sound experimental grounds—that when a dose of many millions of bacteria is given to an animal the great majority of the organisms are soon killed and disposed of, and that fatal infection, if it occurs, is due to the survival and multiplication of the relatively infrequent individuals which are able to withstand the attempts of the animal to destroy them. If after the death of the first animal this new race of exalted virulence is inoculated into a second host a similar selection occurs, and so on through successive animals until the capacity of resisting the mammalian body, in other words the virulence, of the organism has by this selective breeding been developed to the highest possible degree. Whether the mean virulence of the race which is finally obtained is greater than that of the most virulent individual of the original inoculum is unknown, but if there is any such progress in absolute individual virulence selective breeding seems to be the basis of this pasteurian exaltation of virulence by passage. It seems likely, too, that the same process goes on during the course of a natural epidemic. Several experimental observations have, however, lately been made which indicate that this is not always the sequence of events.

Prof. C. H. Browning and Miss R. Gulbransen[1] noticed that very small doses of pneumococci, which in large quantities were rapidly fatal, might set up a chronic pneumococcal septicæmia in mice lasting at least several weeks, during which time the organisms can hardly have been engaged in selective breeding for virulence. The results in this instance may have been due to the original dose having been only a small sample of the pneumococcus population which by random sampling did not happen to contain any highly virulent individuals. If that were the explanation, the experiment would not come off every time, for some of the samples would include the most virulent cocci. The same authors[2] later pointed out that the virulence of the pneumococci present in the heart's blood of a mouse dying within 48 hours of inoculation may be actually less than those inoculated into the animal, and they have recorded a similar loss of virulence in fatal infections of mice with tubercle bacilli. Dr. W. MAIR[3] also records some very significant observations. Rabbits received a prolonged course of inoculation with dead pneumococci and their serum protected mice against many fatal doses of live organisms. The animals then received doses of living pneumococci; after some months they deteriorated in general health, and on examination were found to have a pneumococcus septicæmia with extensive vegetations on the heart valves, reproducing broadly the picture of chronic infective endocarditis in man. The organisms isolated from the blood proved to have lost their virulence for rabbits and mice in the sense that large doses no longer caused acute death. Dr. F. GRIFFITH[4] has also shown that these results may be reproduced in vitro. By growing pneumococci in their own immune serum he finds that a fresh race develops with different cultural characters, resistant to agglutination (as in Dr. E. W. A. WALKER'S classical experiments with typhoid bacilli[5]), impotent as antigen, and with a marked loss of virulence. These modifications suggest that the organism has been selected into a form which to a large extent fails to interact with the host, which is "naturally" immune to it to a certain degree, and which will set up local changes only in such places as the avascular heart valves, where the normal mechanism of response and resistance is defective. It is of much interest in this connexion to recall that Sir THOMAS LEWIS and his collaborators have lately shown[6] that the incidence of chronic infective endocarditis in man is largely determined by the occurrence of small congenital valvular defects.

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[1] Journal of Pathology and Bacteriology, 1923, xxvi., 122.

There are evidently here a series of instances where bacteria will live for a long time in the body, and may cause death, without on the one hand being destroyed by phagocytosis or other defensive mechanism, or on the other reaching an exalted virulence by a process of selective breeding. No explanation of the phenomena is obvious, but it is plain that the facts are of importance and may open up a fruitful field of inquiry. "Virulence" may be too comprehensive a term, and it is possible that it should be dissected into capacity to cause damage in the body and capacity to resist what the body does to destroy the parasite. Such a distinction was foreshadowed by Dr. W. W. C. TOPLEY in his Goulstonian lectures of 1918 on the Spread of *Bacterial Infection*. The pneumococci in Dr. MAIR'S rabbits, for example, have a considerable virulence in causing a particular sort of *damage* and a high virulence in escaping destruction. Which suggests that "virulence" of the first kind may require qualification in respect of different sorts of lesions, a view which finds support in the tissue and species specificity of many bacteria. Our knowledge of the relations between host and parasite is derived mostly from the observation of acute infections; it may well require re-examination in respect of chronic fatal conditions, such as infective endocarditis.

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[2] Ibid., p. 428. [3] Ibid., p. 426.

[4] Reports on Public Health and Medical Subjects, No. 18, Ministry of Health, 1923.

[5] *Journal of Pathology and Bacteriology*, 1903, viii., 34.

[6] Heart, July, 1923.

Annotations.

"Ne quid nimis."

PROF. LEONARDO BIANCHI ON OLD AGE.

Leonardo Bianchi, the great master of Italian neuropathology and psychiatry, is this year relinquishing the professorial chair at the University of Naples to the profound regret of his colleagues and students. Prof. Bianchi took for his farewell address[1] the subject of old age, perhaps in reference to the fact that his retirement was occasioned by the age limit, and it is characterised by much interesting material and apposite remarks. Life is regulated, says Prof. Bianchi, by laws of whose nature we are only partly cognisant. We do not know why certain individuals develop precociously, or why the germ of a great talent arrives at maturity only after a long time in the most diverse changes and circumstances of life—and he went on to draw an eloquent picture of old age as it might be, which we render in his own words:—

How many men lay down their arms in life's struggle before reaching the age of 60! Without any more enthusiasm, or eagerness, or even a new thought or application, with no longer any artistic thrill, nor any ambition, not even a hymn to Life or to beautiful and generous Nature. Such men shut themselves in the spiral recesses of an inert habit. What is the reason why one man is degenerate at 60 years and another preserves his mental faculties at 85 or even 90 or more? There is no biological law which fixes the term when decadence of the mental life begins; there is nothing absolute in this matter. The absolute is found in human laws, often inspired by extraneous interests, associated with profound ignorance of the infinite resources of Nature. Meanwhile let us respect this law, our Duty. There is something which watches over individual interests, and that is Discipline. Obedience, in proportion as the social organism becomes more complex, is the greatest human virtue! Erect an altar to it and let it be your law.

As for myself, as long as I have strength and energy I will dedicate to you my whole thought. We were and are all enthusiasts of youth. I might almost say by occupation. Countless times it has incited my thoughts and rendered verdant year by year my existence with spring-like fertility. Living for several decades among you I have felt year by year the reflex of your spirit in myself, with the enthusiasms and generous impulses of youthful years, the hopes wooed by severe struggles, and the anxieties of work animated by an innate yet indefinite force which rendered even joyous the privations hidden under a chaste and sometimes painful gaiety. Youth must tend to become sublimated as it pushes forwards towards maturity and old age, which give force and experience to the prosperous life of the race.

Happy are they who reach without much travail or severe losses the extreme limit of life; and fortunate is the country where a lucid and cheerful longevity is not an isolated and exceptional phenomenon. And remember that the foundations of a strong old age are laid in the vernal years of life. Let me before taking leave of you give you this advice. Keep a part of your youthful energies for maturity and old age, whose activities are the right of the civilisation of the race. With all the respect due to certain researches on rejuvenation, do not delude yourselves as to the results. The rejuvenation of rats and fowls may be nothing else than a firefly for man; just as illusory as the vital sun that Brown-Séquard dreamt of as standing still in order to carry on victoriously the battle of life. The conception of Goethe will remain eternal as regards humanity, and the modern Mephistopheles, decked out by the laboratory experimenter, will in vain bring you an amorous Margherite if your vital balance results in a deficit in the years of youthful enthusiasm. Devote yourselves to the work of the community, and you will be very happy to feel yourselves even at the age of 75 useful to your country. This is my most fervid wish for you.

Prof. Bianchi cited many celebrated men whose mental vigour in old age was proverbial, such as Hobbes, Michelangelo, Kant, Verdi, and Cardarelli, and quoted the instance of Voltaire, who, two years after he had completed the tragedy "Irene," at the age of 83, wrote to a friend, a professor of philosophy, who had apprised him of his dyspeptic troubles: "Your stomach cannot be in a worse condition than my head; my little apoplectic attack at the age of 83 is quite on a par with the state of your bowels at the age of 40. Let us put my meninges and your intestines on the same dish and give them as an offering to Philosophy."

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[1] La Riforma Medica, xxxix., July 16th, 1923.

FAMILIAL RETINO-CEREBRAL DEGENERATION.

SINCE this condition was first described by the late Dr. F. E. Batten in 1903 a number of cases have been recorded, both of this disease and of the allied condition of familial macular degeneration without mental defect. An important article by Dr. W. H. Nardin and Dr. R. S. Cunningham appears in the June issue of the *American Journal of Ophthalmology*. In discussing the pathogeny of their cases the authors suggest a connexion with the previously described cases of amaurotic family idiocy, generally known by the names of their first describers, Tay-Sachs. All the cases, they suggest, may belong to one progressive type, with definitely decreasing malignity in character, depending on the time of onset of the symptoms.

> "Beginning with the Tay-Sachs type of amaurotic family idiocy, which commences early at 2 to 3 years of age and progresses very rapidly to a fatal termination, we have next in regard to the severity of progression the retino-cerebral degenerative type, the symptoms appearing at the period of second dentition, and finally those cases which, beginning later in life, from the fourteenth year on, show only changes in the retina. . . . It seems possible that the etiologic agent may be the same in these three groups, and the variability of the clinical syndrome the result of the differential resistance of the tissues at different ages."

This last suggestion is of considerable interest, and is well worth bearing in mind by those who have the opportunity of seeing these cases, which are not so uncommon as was once supposed. The present paper records five cases of the retino-cerebral type occurring in one childship of nine members. The age of onset was about seven; epilepsy and progressive impairment of vision, with pigmentation of the macula and progressive mental deterioration occurred. Complete blindness and imbecility followed, terminating with death.

VOLUNTARY AND POOR-LAW HOSPITALS.

Mr. Arthur Henderson, M.P., in a recent letter to the *Manchester Guardian*, pointed out that while thousands of patients are waiting for beds to become vacant in voluntary hospitals, many beds are empty in Poor-law infirmaries, and he called attention to the "serious disorganisation" of the public health service resulting from the distinction between the two types of institution. He referred to a hospital of 15 beds which had 300 patients on its waiting list, some of whom had been waiting for nearly a year; whilst in the Poor-law infirmaries 30,000 beds are said to be unoccupied, as a rule, in the summer months. This communication naturally led to inquiries being made as to the condition of affairs in Manchester and the adjoining districts, with the following results. It appears that at the Royal Infirmary, Manchester, alone over 1200 persons are waiting for admittance, while for all the Manchester hospitals there is an aggregate waiting list of about 4000; so that in Manchester about four would-be in-patients are competing for every vacant bed in the voluntary hospitals. Naturally the question of a pooling of bed accommodation between the Poor-law infirmaries and the voluntary hospitals has been raised. The matter is, however, not so simple as it appears. Whatever the number of vacant beds in the Poor-law institutions in and around London "in the summer months," investigation shows that, so far as Manchester is concerned, beds in the Poor-law infirmaries are filled up as completely as it is considered safe. Before the war the Manchester guardians added 100 beds every two years to meet the needs of the growing population, but this increase ceased during the war. An addition of 200 beds has now been sanctioned. When the number of sick persons chargeable to the Manchester Poor-law hospitals is compared with the total number of beds available—2500—in their institutions, there is only a very small margin of vacant beds; and, moreover, there are generally on an average of from 65 to 70 paying patients in these so-called "vacant" beds. It is stated that the guardians feel that the margin of accommodation at their disposal is so small that little good could possibly accrue from any system of closer coöperation. Much the same state of affairs obtains in Sheffield, which has 775 beds in its voluntary hospitals, while the waiting list numbers nearly 3000, and, moreover, there are very few spare beds in its Poor-law infirmaries; but a promising scheme has been evolved towards the joint control of voluntary and Poor-law hospitals. A Joint Hospital Council, on which the hospitals, the corporation, the boards of guardians, the University, the trade and labour council, and other interests are represented, has been set up and is working successfully. For a year this Council has made arrangements with the Ecclesall board for the reception of patients, paying a fixed rate per patient to the board. There are no "paying patients" in the ordinary sense of the term. To raise money to finance this scheme, it is stated that already over 160,000 of the workers of Sheffield contribute to the hospital scheme a penny out of every pound they earn, and thus become contributors with a direct financial interest in the hospitals, with free treatment therein—certain wards in the Poor-law infirmary being set aside for the use of voluntary hospital patients. By this scheme over £65,000 was raised last year. Over 1700 firms of employers collect the subscriptions, and add one-third to the workers' contributions. This year it is hoped to raise £90,000. A project is on foot to obtain land and buildings for the much-needed additional hospital accommodation, so that the necessary voluntary hospital service may be obtainable to meet present requirements as well as those necessitated by the increase of population.

MISTAKEN CHEST SIGNS.

THE eighth fascicle[1] of Prof. J. Schwalbe's series of monographs on "Mistakes" is devoted to the diseases of the lungs and pleuræ, and is written by Prof. Hermann Schlesinger, of Vienna. If the rest of the series is as entertaining as this volume, there can be little doubt as to the success of its sale. It might be argued that studying mistakes is beginning at the wrong end, and that if the student were carefully taught to associate signs and symptoms with the corresponding morbid conditions there would be no mistakes. By the same token it might be argued that the rising generation should be encouraged to study the blameless lives of famous saints rather than the mottled careers of notorious criminals. But human nature being what it is, we are inclined to find more entertainment as well as instruction in the mistakes of others than in advice calculated to secure colourless perfection. On the subject of asthma alone Prof. Schlesinger is prolific in warning examples. One of the most simple and instructive signs of asthma is prolonged expiration, but the absence of this sign often fails to save the physician from himself and deter him from branding his patient as asthmatic. Eosinophilia is another useful sign of asthma which is frequently not sought, with the result that simple emphysema masquerades as true asthma. Even when asthma is correctly diagnosed it is often badly treated. Iodine and atropine are two of the most favourite remedies, and prescribed with discrimination each has its sphere of usefulness. But when potassium iodide gives no relief, and only provokes increased sneezing and coughing, to continue its exhibition is merely to risk drowning the patient in his own secretions. Yet physicians are apt to continue giving potassium iodide in such cases with a perseverance worthy of a better cause. Atropine also should be abandoned when large doses have been given for some time without benefit. As for the exhibition of adrenalin, it seems to be a veritable pitfall, and when it is given in cases of "cardiac asthma" with disease of the coronary arteries it may provoke severe angina and even death. Prof. Schlesinger appeals on behalf of the asthmatic to the specialist with a passion for progressively eroding the interior of the nose with the thermo-cautery in the benign hope that clearing the nasal passages will abort attacks of asthma. Such treatment may, indeed, do good. But, according to Prof. Schlesinger there are rhinologists who find something pathological in every nose, and whose furor operativus is never to be denied when asthmatics fall into their hands. One of the many lessons of this book of errors is that the best clue to obscure chest symptoms may be found well away from the chest, and that examination of the pupils may betray the tabetic origin of a persistent cough which for years has passed muster as an expression of bronchitis. To confess one's own mistakes is usually painful, but vicarious confession is a soothing avocation, giving joy to the confessor as well as to his audience. Even when it is robbed of its edge by anonymity, it can be made entertaining enough.

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[1] Leipzig: Georg Thieme. 1923. Pp. 152. 3s. 5d.

ACCIDENTAL SYPHILIS IN MEDICAL MEN.

Dr. C. L. P. Trüb,[1] of the University Dermatological Hospital in Bonn, has published a monograph on syphilis as an occupational disease in medical men. This work is frankly a compilation, and the editorial comment with which it is flavoured is of such a neutral and non-committal character that the book is little more than an expanded bibliography. But as such it is very useful and it is likely to prove a valuable work of reference; the more so because of the orderly arrangement and classification of the subjects under discussion. Accidental, extragenital syphilis in medical men is, alas, quite common, and Jonathan Hutchinson alone is said to have seen more than 100 such cases. Dr. Trüb has collected 669 cases from the literature, and it is obvious that this number must represent a mere fraction of the total; syphilis is not a disease which courts publicity. The statistics concerned with the site of the primary lesion show that the fingers, hands, and arms are the parts most frequently infected, and Dr. Trüb has assembled as many as 338 cases in which the chancre was situated in these positions. In another 32 cases the eyes, and in 12 the lips, were the first structures to be infected, and only in two cases was the chancre situated in a tonsil. It is curious to note how frequently medical men and students have deliberately contracted experimental syphilis. It is, perhaps, misleading to use the term "deliberate" in connexion with medical students whose knowledge of the risks they ran must have been far too incomplete to form a basis for deliberation. The medical man who encourages the callow medical student to play the part of the experimental animal in this connexion shows a courage which is as reprehensible as it is vicarious. A separate chapter is devoted by Dr. Trüb to the problem of *post-mortem* infection. About 30 cases of such infection have been recorded, but only about four of them stand criticism, and even in these four cases the evidence is not as complete as it might be. Incidentally, this monograph shows very clearly how nebulous the conceptions of syphilis were up to the time of Jonathan Hutchinson; the vast literature referring to pre-Hutchinson cases of syphilis is practically valueless as judged by modern standards of diagnosis. But even though proven cases of post-mortem infection with syphilis are very rare, this risk cannot be regarded as negligible, and reference is made by Dr. Trüb to the investigations of Prof. E. Hoffmann, who addressed a questionnaire on this point to numerous pathologists and specialists in syphilis. He obtained 29 answers, and in eight of them accounts were given of more or less definite cases of post-mortem infection. One of the most interesting but most incomplete chapters is that concerned with syphilitic infection without a primary chancre. At least 16 such cases have been recorded in which the patient was a medical man, and in five of these cases the infection was extragenital and vocational.

An important question asked by Dr. Trüb is: How shall the medical man who has contracted syphilis comport himself with regard to his professional work? The answer given is quite definite. In the primary and secondary stages, and when there is a definite rash on the hands and arms, no medical man should attempt to operate or attend maternity cases. When the syphilis is in the tertiary stage, it may be sufficient to protect the limbs with rubber or plaster, but it would be well if full work were not resumed until vigorous specific treatment has been shown by the Wassermann reaction to have been successful. Even then the medical man should undergo systematic serological and clinical examination from time to time, keeping an alert eye for any signs of syphilis of the hands and arms. If the Wassermann reaction is positive, it is necessary to be careful, and, preferably, to discontinue medical practice, even when there are no symptoms. This is a hard saying, and obedience to it must often entail a self-sacrifice verging on economic ruin. But its neglect may sometimes have far-reaching consequences, and there have undoubtedly been several cases of syphilis transmitted to patients by midwives and medical men. In one instance alone a midwife has been known to infect 30 women. This case was recorded in 1883, and it is to be hoped that with our present knowledge—diagnostic and therapeutic—of syphilis, the vocational syphilis of doctors has become a much less serious matter than it was.

WORK OF THE ROCKEFELLER FOUNDATION.

IN the review for 1922[1]—including a summary for the first decade—of the work accomplished by the Rockefeller Foundation, by the President, Mr. George E. Vincent, there is presented a survey of unparalleled beneficent work. The Foundation was originally incorporated on May 14th, 1913, under a special charter by the State of New York, and with an initial endowment of $100,000,000, the gift of Mr. John D. Rockefeller. During the past ten years the Foundation has received from its founder a total of $182,704,624. Its total disbursements have amounted to $76,800,000, representing the income from year to year, and $17,500,000 appropriated from principal. In addition, it has pledged future income to the extent of $15,600,000. There is an interesting review of the growth of the science, whose progress, it is pointed out, has followed in a general way Comte's law, which asserts that every body of knowledge passes through two stages, the theological and the metaphysical, into a third, the positive or scientific. This theme is expanded into a chapter on "From Magic to Microbe," and then into an exposition of "Methods, Spirit and Scope of Modern Medicine." As to public opinion and medical progress, it is wisely remarked that unless the leaders of opinion and a substantial proportion of the adult population appreciate the aims and methods of science, science cannot attain the place it deserves or render the service of which it is capable. But in spite of all efforts and in face of evidence there are disheartening instances of an almost benighted ignorance. The remarks on vaccination are singularly appropriate at this juncture.

> "If there is one thing that has been repeatedly demonstrated to the complete satisfaction of all well-trained minds capable of dealing logically with evidence, it is that vaccination for small-pox affords an extraordinary immunity against that disease.....In the United States the disease is widely diffused; in some regions it is almost endemic. Anti-vaccination societies carry on fanatical campaigns of misrepresentation, offering misleading statistics, invoking the authority of discredited physicians, citing unverified cases, and making emotional appeals."

There are some valuable remarks on "the training of doctors," and it is pointed out that "the idea of teaching the medical student all that is known about health and disease is on the face of it absurd." A tentative list of the medical schools of all countries prepared by the Foundation shows that there are in all 445 schools, distributed geographically as follows: United States 82, British Isles 43, France 32, Russia 28, Germany 25, China 24, Italy 21, Japan 20, India 18, Spain 11, Mexico 11, Brazil 10, Canada 9, Netherlands 8, Switzerland 5, Belgium 5. Forty-four other countries support from one to four medical schools each. It is the aim of the Foundation to hasten the development of international coöperation in medical education by all available means. An account is given of what has been done for the Peking Union Medical College, and the aid afforded to European medical scientists. Much stress is laid on the training of health staffs in connexion with public health and preventive medicine, and the manner in which this is carried out. Significant and instructive are the titles of other chapters—"Closing in on Yellow Fever," "Controlling Malaria at Low Cost," "Hookworm Disease as an Educator." We have travelled a long way since the first European conference to consider health problems—representing 12 nations—was held in 1851. In the field of international hygiene there has been established a recent creation under the League of Nations of a health organisation which has the support of 52 nations and the sympathetic coöperation of the United States. The Foundation also works through non-governmental organisations and voluntary institutions of various kinds in order to carry out its chartered purpose, which is to promote, not the exclusive prosperity of any one nation, but "the well-being of mankind throughout the world."

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[1] Die Syphilis als Berufskrankheit der Aerzte. Von C. L. Paul Trüb. Carl Marhold Verlag, Halle a. S. 1923. Pp. 126.

[1] The Rockefeller Foundation: A Review for 1922 and a Summary for the First Decade. New York. 1923.

THE FIGHT AGAINST RABIES IN DOGS.

THE importance of the strictest observance of the regulations in force with regard to rabies in dogs can hardly be overestimated. Whereas in this island country the number of infections have been reduced to a vanishing point, on the Continent, owing largely to laxity during the war and post-war periods, the disease is greatly on the increase. Recent figures collected in Vienna[1] show that the number of infected dogs trebled during the years 1919–22, and that during the same period the number of human beings treated at the Lyssa Institute doubled. The number of dogs registered in Vienna rose in those years from 37,000 to 77,700, so that in 1922 there was roughly 1 dog to every 24 inhabitants, children included, and this number does not account for the many unregistered dogs. The effect of legislation in the directions of a dog tax, compulsory muzzling, immediate notification and destruction of all dogs known to be or suspected of being infected, regular periodic examination of all dogs and notification of all dog-bitten humans, has been remarkable, as figures from many countries show. The experience gained during the last 40 years at all treatment centres teaches that if these measures were systematically and conscientiously carried out, the disease might be completely wiped out; but it has been found extremely difficult to insist on such measures even in the large towns, and still more so in the outlying districts. One factor that has to be reckoned with is the human love of dogs, and this presents one of the greatest difficulties. Education of the public is one of the most important factors in dealing successfully with the problem. Legislative measures will take a long time to free mankind from the scourge, and therefore additional measures might well be adopted. Dr. Schnürer has since 1905 been employing prophylactic inoculation of dogs against the disease, a measure first suggested by Pasteur, and later worked out by Bouley (1884) and Högyes (1889), but the difficulty in applying it on a large scale to all dogs lay in the fact that to produce sufficient attenuated virus (fixed virus) not all the rabbits in Australia would suffice, and therefore Dr. Schnürer has worked out a scheme whereby stronger and more virulent doses are given, so that fewer injections are necessary, reducing the number from 14 to 2–3. According to the present experience at the Lyssa Institute, the duration and effectiveness of the protection afforded by inoculation depends on the quantity of the fixed virus introduced. As the result of experiments on 93 dogs it was found that by giving 1–2 doses containing a total of 0·33–20·0 g. of the virus subcutaneously or intraperitoneally, the animals could be immunised against infection introduced intraocularly, subdurally, or intramuscularly with 63·6–100 per cent. successes, depending on the nature of the virus and the site of introduction of the infection. Such doses were not injurious to the animals, and the immunity commences on the thirteenth to eighteenth day and lasts up to five years. To demonstrate the use of prophylactic inoculation Dr. Schnürer is now engaged in carrying out experiments on privately owned dogs, who attend as out-patients. He inoculated 50 with five injections of virus in increasing doses, giving a total of 0·665 g. The next 90 dogs were given four injections containing 0·76 g. altogether. One of these was previously bitten by an infected dog and died of rabies; in the rest up to date there has been no evidence of the disease. Fuller details and tables of results are given in the original article.

THE PRODUCTION OF CLEAN MILK.

WHILE official machinery for encouraging the production of clean milk is grinding slowly, and let us hope surely, towards its appointed end, there are abundant indications of a keen desire within the dairy trade itself, and in a variety of bodies associated with the trade, for an improvement in the purity of the milk-supply. We have before us a pamphlet on "Milk Competitions," by the National Clean Milk Society, a body whose avowed object is "to raise the hygienic standard of milk and milk products, and to educate the public as to the importance of a clean and wholesome milk-supply." The pamphlet gives a lucid and useful description of methods of improving the production and the quality of milk through the stimulus afforded by competitions. Two score card systems are described, the more elaborate adapted for assessing the efficiency of production, and the simpler system for evaluating the quality and purity of the final product. The information is set out in simple style. It is suggested that the promoters of such competitions might arrange for the prizes to be offered either by public health authorities, by local organisations anxious to promote improvement in the hygienic quality and chemical composition of the milk-supply, or by firms directly interested in the milk industry. In the same connexion reference may be made to a paper by Mr. A. T. R. Mattick, of the National Institute for Research in Dairying, Reading, on the production of clean milk. The paper deals in detail, in the clearest way, with the whole course of production of milk, from the cowshed and the milking shed to the milk room up to the stage of bottling, including details of the preparation of utensils, of premises, and of the cow. The pamphlet does not aim at putting forward any specially original views, but it succeeds in providing a simple and systematic description of procedure which should be of real value to the dairy farmer. The distribution of instructions of this type throughout the dairy industry—especially if such distribution were organised by the industry itself—would be more likely to create an atmosphere leading to improvement in milk-supply than the most heroic efforts of the official administrator. The process of cleaning must indubitably, if it is to be effective, come from within the dairy trade itself.

INTERNATIONAL CONFERENCE ON LEPROSY.

THE Third International Conference on Leprosy assembled at Strasbourg from July 28th to 31st. Official delegates representing 46 countries attended this conference, and a number of learned societies and other organisations from different countries were also represented. Great Britain, India, Australia, and some other British dominions, colonies, and protectorates were separately represented by official delegates. The conference was opened by Mr. Paul Strauss, the French Minister of Health, and the scientific sessions were held under the presidency of Dr. Ed. Jeanselme, professor of medicine in the University of Paris. The official text of the resolutions embodying the conclusions arrived at as the result of the deliberations of the conference is as follows:

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[1] Prof. Josef Schnürer, Wiener klin. Wochensch., July 12th, 1923.

La 3ème Conférence Internationale Scientifique de la lèpre maintient les principes d'organisation de la lutte contre la lèpre admis par les conférences précédentes et adopte les résolutions suivantes :

(1) Les prescriptions legislatives concernant la lutte contre la lèpre doivent différer suivant les pays auxquels elles s'appliquent, mais, dans tous les cas, il faut interdire l'entrée des lépreux étrangers.

(2) Dans les pays où la lèpre est peu répandue, l'isolement dans un hôpital, ou à domicile si celui-ci est possible, est recommandé, tel qu'il est pratiqué en Norvège.

(3) Dans les foyers d'endémie lépreuse, l'isolement est nécessaire. (*a*) Cet isolement doit être humanitaire et laisser le lépreux à proximité de sa famille, si cette mesure est compatible avec un traitement efficace. (*b*) S'il s'agit d'indigents, de nomades ou de vagabonds et d'une façon générale de personnes qui ne peuvent être isolées à domicile, l'isolement sera pratiqué et le traitement le plus efficace sera appliqué dans un hôpital, un sanatorium ou une colonie agricole suivant les cas et les pays. (*c*) Il est recommandable de séparer de leurs parents les enfants de lépreux dès leur naissance et de les maintenir en observation.

(4) Les membres de la famille du lépreux doivent être soumis à des examens périodiques.

(5) Il faut faire savoir aux populations que la lèpre est une maladie contagieuse.

(6) Il y a à interdire aux lépreux les métiers qui les exposent à propager les germes de leur infection, mais en ce cas la société a le devoir de considérer que cette interdiction lui impose l'obligation d'assister le malade et les personnes dont il est le soutien.

As no official English text of these resolutions was presented or discussed at the conference, it would obviously be out of place to print an unauthorised translation of them.

DECAPSULATION OF THE KIDNEY IN ECLAMPSIA.

Dr. Albert Niedermeyer,[1] of Schönberg, reports a case of severe eclampsia with coma, in which the life of the patient was saved by decapsulation of the kidney.

On Jan. 9th, 1923, the patient, a primipara, aged 20, was seized with eclamptic convulsions, which rapidly increased in severity and frequency until they were almost continuous. The presentation was normal, and the membranes were intact, but the fœtal pulse-rate rose rapidly and was soon imperceptible. Catheterisation produced a few drops of brownish urine, which solidified on boiling. As the condition was urgent, and there was little possibility of saving the child (seventh month) perforation was undertaken under light chloroform anæsthesia, and the uterus was emptied. Treatment by venesection, morphia, and chloral in a darkened room was given, but the hope that the rapid emptying of the uterus would arrest the convulsions was not realised. On Jan. 10th, at 10 A.M., saline was given, one litre rectally and one litre subcutaneously, and at 11 A.M. venesection was repeated. During the afternoon coma set in with loud snoring, cyanosis, and foaming at the mouth; at 3 P.M. the saline infusion was repeated, but the coma deepened and was accompanied by complete anuria. A few drops of urine which were withdrawn coagulated. The respiration and pulse became worse, the face and lips were blue, the pupils dilated and fixed, the face sunken, and there was a tracheal rattle. As death seemed imminent decapsulation was undertaken as a last resort. At 5 P.M. the kidney was exposed under light chloroform anæsthesia, and without displacing the organ the capsule was removed as far as possible, the remainder being stripped back as far as the hilum. The wound was closed in layers and a gauze strip inserted into the lower angle. From the time of the operation onwards there were no further convulsions, the respirations and pulse improved, and the coma lessened into a quiet sleep, with disappearance of the cyanosis. On the following day, at 6 A.M., the patient reacted when spoken to, and at 9 A.M. 300 c.cm. of light-coloured urine were withdrawn on catheterisation; albumin by Esbach $\frac{1}{2}$ per thousand. In the evening 200 c.cm. were withdrawn with a trace of albumin, and during the night a quantity of urine was passed spontaneously. On Jan. 12th consciousness returned, and from the next day the urine remained free from albumin. The wound healed by first intention, and on the 27th the patient was discharged.

In this case it can hardly be doubted that the operation was directly responsible for the immediate improvement. Dr. Niedermeyer is of the opinion that had it not been so, the condition of the patient was so grave, that an intervention of that magnitude must have been fatal. Of interest is the rapidity with which the operation had effect. Dr. Niedermeyer quotes Edebohl, who holds the view that decapsulation first shows its effect 10 days after the operation; but from the experience derived from the case reported, he cannot agree with him. It was obvious that here the effect was immediate, but he is inclined to think that the operation should only be undertaken in cases of acute anuria, and that in such cases it can have no purpose unless the effect is immediate. In discussing the mechanism of the results of decapsulation, he reminds us of the view expressed by Edebohl and others that new blood-vessels are formed between the surface of the kidney and the surrounding fat capsule, and thus the blood-supply to the organ is improved. But it has been shown that in some cases a new fibrous capsule very soon develops in place of the one removed, possibly before the new capillaries have had time to form, and anyway, if a new capsule did not grow, the development of the new blood-supply would be too late in acute cases, where the effect is required immediately. Most recent authors take the view that the chief effect lies in the mechanical relief of the renal tension, and the French writer Pousson, speaks of "glaucoma of the kidney." It appears that in acute anuria it is the enormous rise of intrarenal pressure, increased by the non-elastic, firm capsule, that leads to obstruction to the circulation and to the outflow of urine, and finally, to complete paralysis of the secreting cells. If this explanation is accepted, it is obvious that if decapsulation helps the kidney, it does so immediately, and it also explains why in chronic cases the results are so disappointing. It also explains why unilateral decapsulation is sufficient, for no sooner is the pressure on one side relieved, and the passage of urine accomplished, than is the attempt at secretion by the other lightened, and so the vicious circle is broken. The second kidney then gradually recovers its equilibrium. Obviously the danger of a unilateral operation is less than a bilateral, especially as the operation is hardly to be recommended except when other measures have failed and the patient is in extremis.

THE MIDDLE WAY IN THE TREATMENT OF FUNCTIONAL NERVE DISORDERS.

Dr. R. G. Macdonald Ladell, in the *Practitioner* for August, presents certain principles which have emerged from the chaos of controversy. His "middle way" lies between psycho-analytical technique on the one hand, and the total neglect of mental processes on the other. There can be but few practitioners, he judges, whose work brings them much in contact with nervous disorders who do not realise the fundamental truths of Freud's doctrines; yet, though for some cases psycho-analysis is necessary, current conflicts predominate in most of the patients who seek the aid of the physician, and for these no deep analysis is needed. But the physician must be prepared to discuss many questions, both in regard to sex and to other difficulties, when the shoe of civilisation pinches, and he must be free of embarrassment or diffidence, which, if shown by him, will only increase the patient's repressions. Plainly, as Dr. Ladell says, the personal factor is bound to count largely when dealing with these cases, and his remarks suggest that radical differences of opinion on what should be matters of observation perhaps have their origin in the temperament of the observers. We can imagine the neurotic, who is often sensitive and over-scrupulous, withdrawing into the protective shell of reticence at the slightest hint of surprise or embarrassment on the part of the physician, just as we can imagine—or perhaps recall—physicians whose manner invites that open confession which is good for the soul. One temperamental type of medical man finds himself making observations and gathering facts about neurotic illnesses which for another type remain as in a closed book. The fundamentals of psychopathology are now sufficiently established for such inequalities to be lessened by giving instruction in the subject to the medical men and women of the future. Whatever kind of case may be allotted to the psycho-therapist, the middle way in treatment must be the way of the general practitioner.

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[1] Deutsche medizinische Wochenschrift, June 8th, 1923.

PROF. IVAN PAVLOV IN LONDON.

At the conclusion of a two-months tour in France and the United States, Prof. Ivan Pavlov of Petrograd attended the International Congress of Physiology at Edinburgh, after which he spent a week in London before returning to Russia. We have received from a correspondent an account of a visit which he paid to the Middlesex Hospital on August 6th, when he was received by a number of members of the medical staff of the hospital and its medical school, and expressed appreciation of all that he saw, being particularly interested in the cases of diabetes under treatment with insulin, and in the new laboratories which are shortly to be opened. The eminent physiologist, who is now in his seventy-fourth year, is a striking example of the boundless activity and imaginative force which is the gift of the greatest scientists. Amidst the tragic chaos of the revolution in Russia he has been able to continue his work, and it comes as a surprise to many in this country to learn that at the present moment he has some 30 fully-qualified assistants working under him at his laboratories at Petrograd. Prof. Pavlov, during his visit to the Middlesex Hospital, made especial comment on two things. The first was that the hospital, the research departments, and the medical school formed a complete unit, allowing the fullest coördination between teaching, research, and modern treatment, a condition of affairs seldom successfully realised elsewhere. But side by side with this he was disappointed to find here, as in other institutions in England, that research is seriously hampered by the severity of the restrictions on vivisection. The wide repute of Pavlov's book on the "Work of the Digestive Glands" may have obscured the realisation in the minds of the medical profession of the fact that his work has chiefly been concerned with the physiology of the central nervous system. For many years past his experiments have been directed to elucidate the problems of sleep, inhibition, and conditional reflexes. We are happy to learn that this work is now far advanced, and that Prof. Pavlov hopes in the autumn to bring out a book which will be to the neurologist as profoundly interesting and important as was his work on digestion to the general physician and physiologist.

KING'S COLLEGE HOSPITAL.—An extraordinary meeting of the Committee of Management of King's College Hospital was held on August 9th to authorise the establishment of a dental school under the direction of Dr. Alexander Livingston of Liverpool University. At the same meeting was received the resignation of Mr. F. F. Burghard, senior surgeon, to whose work in connexion with the hospital and medical school a tribute was paid by the chairman, Viscount Hambleden. He is succeeded on the committee as senior surgeon by Sir G. Lenthal Cheatle. To the committee was also added Mr. P. A. Willson. The other business included the appointment of Mr. H. J. R. Surrage as an additional honorary anæsthetist. The committee passed a resolution of thanks to the Winter Distress League for undertaking a considerable amount of cleaning in different parts of the hospital which could not otherwise have been done owing to lack of funds, and also gratefully accepted the offer of the Talfourd College for Girls to maintain a cot in the children's ward.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXIII.

TREATMENT OF SYPHILIS IN THE WOMAN OF CHILD-BEARING AGE.

SOME competent observers have stated that syphilis in women is in the main a much less serious infection than it is in the male. This may be so for the individual, though I am not prepared wholly to admit it; but for the ultimate welfare of the race no case of syphilis in a woman can possibly be dismissed as a light case, or as necessitating a lower standard of treatment than one showing more serious manifestations. The treatment of syphilis in women presents two different aspects: the first is that of acquired syphilis with signs and symptoms as in the male; the second is conceptional syphilis in which frequently during the child-bearing period no signs appear, the woman complains of no disability, but gives birth to premature, stillborn, or weakly and diseased children.

Acquired Syphilis in Primary or Secondary Stage.

Here the treatment is straightforward, its duration depending on the stage at which the case is seen; the patient requires a minimum of two years' steady treatment if seen in the primary stage—considerably more if not seen till secondary lesions are present.

If properly prepared—i.e., with bowel empty and no meal having recently been taken—women almost always take intravenous injections of 914 preparations well. At the menstrual period a smaller dose may well be given, but otherwise doses ranging from 0·3 to 0·6 g. are injected once a week, either of novarsenobillon, sulfarsenol, or stabilarsan, till 4 g. in all have been given. At the same time pil. Hutchinson should be taken thrice daily and a gargle of pot. chlor. is used as routine after each meal. In my experience women much prefer taking pil. Hutch. orally rather than have the routine injection of Lambkin's cream in addition to the 914 injection. After a course of 914, pills are stopped for two weeks, and then a Wassermann test is done. If the W.R. is negative and the case was first seen in the primary stage, the patient is allowed to carry on with pills alone for two months, when the W.R. is again tested; but if the case was first seen only when well-established secondary lesions had developed, the patient is given pills to last a month and told that a further set of injections will be given at the end of that time. The patient either takes a little sulphur at night during this month—many patients like confection of sulphur or trochisci sulphuris as aperients—or else the second course of injections is ushered in by an injection of intramine, sulphur being used as an antidote to, or as a preventive of, metallic poisoning by arsenic or mercury. The second course of injections may be of a slightly different type from the first—i.e., if N.A.B. was given in the first instance, sulfarsenol (0·36 to 0·6 g. dose) may be given, or silver salvarsan (0·1 to 0·3 g. dose) till 1·5 g. of the latter or 4 g. of the former have been given. The W.R. is then repeated, and if it is negative and if no signs or symptoms are present the patient is treated by pills only. The urine is tested for albumin as routine before each injection and inquiry is made as to any unpleasant symptom following the last injection—any complaint of headache, sickness, or urticaria requiring careful investigation. Bowels should be carefully regulated with salines and all carious teeth must be removed.

During the remainder of the treatment Wassermann tests are taken about every three months and a further course of injections is given if required. If all the tests are negative and the patient's condition is satisfactory pills only are given during the remainder of the time.

Standard of Cure in Women.

The standard of cure adopted at my clinic is persistently negative W.R. over two years without sign or symptom, even after a provocative injection has been given. If this standard is met by a patient she is discharged, on the clear understanding that if she becomes pregnant she must return for treatment by the time she is eight weeks pregnant. A case first seen in the late secondary stage is hardly likely to reach this standard of cure, and in many cases these patients after three years steady treatment are sent away and told to return twice a year for a month's intensive treatment—i.e., injections of 914 and a mixture of potassium iodide and mercury. This method of dealing with intractable cases has so far given most gratifying clinical results.

Conceptional Syphilis.

A considerable number of women are met with who have given birth to stillborn or diseased children without themselves showing any signs of acquired syphilis, at least during the child-bearing period. These are mainly the wives of men who have had syphilis and have been insufficiently treated. These cases are most intriguing and sometimes very difficult to diagnose as they are frequently seen for the first time during pregnancy, having been referred for an opinion from a maternity centre. When besides a history of ante-natal and neo-natal deaths a positive W.R. is obtained, treatment is at once instituted; but the W.R. is very uncertain during pregnancy and just after delivery, so that a negative W.R. does not of necessity exclude conceptional syphilis. In such a case an effort is made to get an interview with the husband and often a very old history of syphilis is obtained, the man frequently having forgotten about it as he has had no symptoms and has not connected his wife's obstetric calamities with his old disease. I could quote instances of this type of case in which the woman's W.R. had never been positive.

It is held by some syphilologists still that a mother with no symptoms and a negative W.R. is not herself syphilitic and does not require treatment. This seems to me an unsound theory; there appears to be in these cases of conceptional syphilis a degree of immunity in the mother herself which frees her from signs and symptoms of syphilis *during the child-bearing period;* but after the menopause symptoms frequently appear. There are in my department several women past the menopause who never had syphilitic manifestations while childbearing, and now have gummata of the back or thigh or the common ulceration of the outer side of the ankle and a positive W.R. In practically every history a case is obtained of stillbirths or of delicate weakly children who died young; one woman, who was perfectly well till a gumma occurred on her thigh this year, has her youngest child, aged 19 years, being attended at an eye hospital for "Hutchinson's salmon patches." I think this post-menopausal appearance of symptoms is a complete refutation of the claim that these women are not syphilitic.

Treatment of Syphilis During Pregnancy.

The treatment of syphilis in women during pregnancy is practically the same as at other times. These cases of conceptional syphilis are at once given pil. Hutchinson and have a weekly injection of 914 for about six weeks; after that a fortnightly one till 4 g. has been given. Injections may be given right up till the day of delivery without ill-effect. Patients are encouraged to return as soon after delivery as possible and are then given from 6 to 10 fortnightly injections of 914 while suckling. Cases that have previously had complete treatment for syphilis require, of course, only a few injections during pregnancy, an injection every three or four weeks usually being ample. There has been practically no toxæmia in these cases and the children are remarkably satisfactory, strong, without lesions, and in most cases above the average birth weight. One little known but quite definite symptom present in some of these cases of conceptional syphilis is a purulent vaginal discharge which may be slight or profuse, *is not gonococcal*, and clears up without any local treatment when antisyphilitic measures are adopted. This symptom has to my knowledge been mentioned in this country by only one other observer, Prof. W. C. Swayne,[1] of Bristol, but has been seen by me for some years and pointed out to students.

Conclusion.

I would emphasise the necessity for all practitioners to have their cases of possible conceptional syphilis carefully investigated. With a history of stillborn or weakly children and with no toxæmia of pregnancy or obvious disease of either parent the possibility of conceptional syphilis must be borne in mind; the results of treatment far outweigh any slight inconvenience—they are really brilliant; the technique is simple and the cost very moderate.

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Medical Officer in Charge of Female V.D. Clinics, Royal Free Hospital and Blackfriars Skin Hospital.

Special Articles.

FACTORY INSPECTION IN 1922.

REPORT OF THE CHIEF INSPECTOR.

THE report of the Chief Inspector of Factories[2] shows how the work of his department is becoming more and more technical and specialised; thus while there are 137,858 registered factories (apart from 145,684 workshops which for the most part are small and of inconsiderable importance), special codes of regulations, in addition to the main provisions of the Factory Acts, apply to 99,332 works or departments within works. The duty of enforcing the requirements of these codes calls for technical knowledge and must be onerous. Accident prevention has continued to receive special attention, and important progress is reported in improving the standard of safeguards; but the spirit of safety-first—the appeal to the mentality of the worker—is being called upon to effect better results. Instances of its value are quoted: a fall from a figure of 94 in 1920 to one of 52 in 1922, combined with a lessened severity rate from 1·44 days lost per 1000 workers to 0·88; a reduction in lost-time accidents from 347 in 1919 to 80 in 1922; a reduction in compensation paid per £100 wages from 5*s.* 6½*d.* in 1914 to 2*s.* 10*d.* in 1922. Such instances are proof of the value of eliminating hazardous practices. Accidents are frequent among casual labour, but far less so among regular and experienced workers; hence labour turnover should be minimised. Hours of work would appear to have been permanently reduced without recourse to legislation, and now rule at from 44–48 per week. Output would not seem to have materially suffered, while overtime rates militate against any extension in the future; the half-time system for children has disappeared even in Lancashire; the two-shift system has not had a fair trial yet, as, although 235 Orders have been made permitting it, it has, owing to trade depression, been actually used in only few cases.

Voluntary (in contra-distinction to statutory) welfare is holding its own, it is the direct outcome of the war period and is the spirit of true welfare, which must come from within—from the workers themselves and the management. In one interesting scheme the vicar of the parish acts successfully as welfare supervisor, even seeing after the fencing of machinery. Another venture is the combination of employers to support schemes for all their employees. Statutory welfare is enforced by special orders, of which there are now many applying to different industries; good work is being done thereby, but there is danger lest the letter, rather than the spirit, is complied with. First-aid equipment is now an integral part of works organisation, and septic poisoning is being materially reduced thereby, a decrease of 50 per cent. being reported by one insurance company.

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[1] Brit. Med. Jour., 1921, ii., 476.

[2] Annual Report of Chief Inspector of Factories for 1922. H.M. Stationery Office. [Cmd. 1920.] 1923. Pp. 153. 5*s.*

Lead Poisoning.—Electric Shock.

Dr. T. M. Legge's report is rather shorter than usual; he tells of the control maintained over lead poisoning, which now only accounts for less than 250 cases a year, whereas ten years ago 500 cases seemed to be an irreducible minimum; the pottery industry still contributes unduly to the total. Interesting figures are given of the occurrence of epitheliomatous ulceration; 64 per cent. of the cases were between 40 and 60 years of age, and 20 per cent. over 60; 51 per cent. had been employed 20 years and over with exposure to pitch, tar, or paraffin; the face and neck were implicated in 43 per cent. of the cases, and the scrotum and groin in 29 per cent. The examination by certifying surgeons of young persons for fitness is gradually increasing in importance, but remains unsatisfactory for lack of any subsequent examination; about 2 per cent. of juveniles were rejected as unfit.

Mr. G. S. Ram deals with accidents due to electric shock, and again stressed the need for prolonged artificial respiration in every case; he instances cases brought round after 15, 20, 30, and 45 minutes, as well as others where efforts were either not attempted or given up after a few minutes. He puts forward an observation, quaint and unexpected, that after severe and prolonged shock, if the patient has a bad fall but escapes from fatal injuries, he recovers from the shock; and asks whether mechanical shock may not be a successful form of treatment for cardiac fibrillation, and how it should be applied.

Special Research Work.

A feature of the report is the inclusion of special research work; that of Dr. G. L. Middleton on the effects of dust inhalation will be referred to in connexion with a special report by the same author in collaboration with Dr. E. L. Macklin; another report, by E. M. Hewitt and E. M. Bedale, concerns the physiological cost to women of different methods of weight-carrying. This is an instance of laboratory research directed to elucidate a practical problem; different weights were carried (*a*) on a tray, (*b*) on a tray with shoulder strap, (*c*) with load divided, and (*d*) with load on shoulder, while the oxygen consumption per horizontal kilogrammetre of work was estimated. For loads of 20 to 30 lb. the method of carrying seemed to be a matter of personal choice; at 40 lb. a divided load or shoulder carrying was more economical; at 50 lb. shoulder carrying was cheapest. Details of the observations made and illustrative graphs are given.

CONGRESS OF THE ROYAL SANITARY INSTITUTE AT HULL.

IN THE LANCET of August 4th (p. 251) we dealt with the opening of this Congress and the President's address. The business of the Congress was transacted in four sections—viz., Sanitary Science, Engineering and Architecture, Maternity and Child Welfare (including School Hygiene), and Personal and Domestic Hygiene, and in seven conferences—viz., those of Sanitary Authorities, Port Sanitary Authorities, Medical Officers of Health, Engineers and Surveyors, Veterinary Inspectors, Sanitary Inspectors, and Health Visitors. The multiplicity of subjects was so great that it may be truly said that every delegate had some opportunity of voicing what was in his mind. It was perhaps inevitable that occasionally the programme should be overloaded, but we would respectfully suggest to the management that at future congresses the business should begin at 9.30 A.M. and end at 1 P.M. The nominal hours were from 10 to 2, but the hour from 1 to 2 P.M. is purely nominal. We would also suggest the limitation both of the number and duration of the presidential addresses. Space permits reference to only a very few of the subjects discussed.

Housing.

The housing question, as was natural in the present parlous condition of housing, received much attention. The city engineer of Edinburgh, Mr. A. H. Campbell, advocated the acquisition by local authorities of all slums in their areas with a view to putting them into a better state, pending the erection of a sufficiency of new houses. Alderman Cheverton-Brown, secretary of the National Federation of Property Owners, voiced the difficulties of property owners, including the problem of the dirty and destructive tenant. His remedy for house shortage was the removal of restrictions, the restoration of confidence amongst investors, and the encouragement of private enterprise. Miss A. Churton, secretary of the Rural Housing and Sanitation Association, also favoured the acquisition of unhealthy areas and their management on lines associated with the name of Miss Octavia Hill. The woman's part in smoke abatement was ably dealt with by Mrs. Cloudesley Brereton, and the much more extended use of electricity in the home was advocated in a practical manner by Lieut.-Colonel Vignoles, borough electrical engineer of Grimsby. The latter's ideal was a house with one fire for the hot-water cistern, and in which electricity is used for lighting, cooking, heating in the other rooms, and as an auxiliary to the hot-water supply.

Preparation of Food.

The hopeless state of housing probably stimulated interest in the food question. Miss Florence Petty indicated how better knowledge of cookery might be conveyed to existing mothers. Mr. A. R. Tankard, F.I.C., showed that 20 per cent. of our foods, exclusive of milk, are chemically preserved. The need for much greater cleanliness in the preparation and distribution of food was discussed by Dr. W. St. C. McClure, who advocated the licensing and supervision of all premises where food or drink is prepared or served. The importance of food, and especially of a vitamin-rich diet, as a means of increasing resistance against tuberculosis and of preventing a minor infection from developing into recognisable disease was strongly emphasised by several speakers.

Other Topics.

Dr. O. K. Wright (of the Ministry of Health) supplied an interesting paper on scientific methods in public health propaganda, and Dr. W. Allen Daley (M.O.H., Blackburn) dealt with this subject in special reference to cancer. Light treatment was dealt with at various sessions, and Sir Henry Gauvain gave an instructive address on Alton methods. A thoughtful and suggestive paper on infantile mortality by Prof. F. E. Wynne (M.O.H., Sheffield)[1] provoked a good discussion, but seemed to be misunderstood by several members of his audience. Papers by Dr. S. G. Moore (M.O.H., Huddersfield) and Dr. H. Scurfield (formerly M.O.H., Sheffield) dealt more particularly with that portion of infant mortality which occurs in the first month of life. While Dr. Scurfield left it an open question as to how the new midwifery—i.e., the execution of the skilled obstetrical work during pregnancy instead of as an emergency procedure during labour—was to be carried out, Dr. Moore advocated the Huddersfield system of notification of pregnancy, by means of which the expectant mothers are visited at home by duly qualified doctors appointed by the corporation.

Tuberculosis and Milk.

In the discussions on the prevention of tuberculosis some speakers favoured the cutting off of the supply of seed and others favoured making the soil unsuitable; the Greek representative, Dr. Alexander Cawadias, intervened usefully to point out that we

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[1] See THE LANCET, August 4th, p. 211.

of the medical services. He proposed to appoint a medical officer of health for each county, with school medical inspectors and tuberculosis medical officers under him. He hoped that such salaries would be paid as would attract the best young doctors in the profession in Ireland. He did not favour the establishment of a Ministry of Health apart from that of Local Government; he considered it was only a difference in nomenclature which in practice meant very little. He favoured the formation of an advisory body similar in functions to the existing Irish Public Health Council, but thought that the question of a national medical service required further consideration. The deputation then continued the discussion with Mr. McCarron, Secretary of Local Government, and Dr. E. F. Stephenson, Medical Administrator.

Mr. O'Maille, T.D., brought forward the case of the Co. Galway doctors, especially those in the Connemara district, and protested against the action of the Local Government Department in refusing to sanction the full amount of £300 per annum for dispensary doctors in Co. Galway. Two representative practitioners from Connemara stated that their districts were 20 miles in length and 15 miles in breadth; one of them mentioned that the population of his district was over 8000, that as many as 80 per cent. of these were treated gratuitously under the Medical Charities Acts, and that to give sufficient attendance to the sick in his district he would have to be paid more than double his present remuneration to cover travelling expenses.

The deputation discussed at considerable length other questions concerning the Poor-law Medical Service—viz., inadequate salaries, arrangements for holidays, and fees for occasional services.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Passing of Another Pioneer.

WITHIN a few weeks of the death of Dr. Hermann Biggs, reported in my last letter, New York has lost another of her medical pioneers by the sudden death from heart failure of Dr. John H. Pryor, head of the board of directors and physician in chief at the Perrysburg Hospital. He was the founder of Ray Brook Sanatorium, the first public institution for the exclusive treatment of tuberculosis in this country, and situated only a few miles from the Trudeau Sanatorium at Saranac Lake. Afterwards, at Perrysburg, he turned his attention to the treatment of surgical tuberculosis by heliotherapy and artificial light, and developed an institution worthy to be compared with those of Sir Henry Gauvain at Alton or of Dr. Rollier at Leysin. Dr. Pryor was also one of the founders of the National Tuberculosis Association. He was 62 years of age.

Control of Urine Sugar under Insulin Treatment.

The importance of avoiding dangerously low sugar excretion has been amply demonstrated during the early experience with the treatment of diabetes by insulin. Mr. Irvine H. Page, of the Eli Lilly Research Laboratories, reports a method[1] for which he claims both simplicity and accuracy, with the additional advantage that it can be used for determining slight excess of sugar excretion in "borderline diabetes." This method consists in hourly sugar determinations throughout the day (7 A.M. to 7 P.M.), and a further test of the 12-hour combined night urine, by the Benedict-Osterberg method.[2] Mr. Page's experiments showed that the curve of normal sugar excretion is remarkably constant with a slight upward trend from morning to evening, and a low level during sleep. During the hour following meals there occurs a sharp rise which is in no way dependent upon the quantity or quality of food ingested. Great variations and remarkable constancy of sugar excretion may be found at different times in the same individual. Mr. Page fixed as the upper limit of a normal curve 110 mg. of sugar in the hour. Among his supposedly normal subjects, towards whom no suspicion of glycosuria had ever been entertained, there were some who considerably exceeded this allowance, which leads Mr. Page to the conclusion that the method is likely to prove valuable for the determination of unsuspected glycosuria. It is, however, a little elaborate as a routine test. There can be no doubt, on the other hand, that it will give valuable information during insulin treatment. Mr. Page considers that the lower limit of safety in a patient undergoing insulin treatment is 30 mg. per hour. Fortunately the amount of insulin required to reduce "normal urine sugar" to a dangerously low level greatly exceeds that needed to reduce pathological wastage, but this fact does not excuse the administrator of insulin from taking every precaution to avoid a dangerous hypoglycæmia.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Insulin Treatment in Vienna.

AT a recent meeting of the Vienna Medical Society the insulin treatment of diabetes was discussed, and Prof. Falta described his experiments made in order to obtain the active substance. The animals used were dogs, fœtal calves, fish, and latterly sheep, pigs, and oxen. The results of the treatment are very encouraging. Large doses are necessary, each dose being equivalent to the quantity of insulin required to diminish by 50 per cent. the blood-sugar in a medium-sized rabbit. The employment of insulin is not free from risk; excessive doses produce hunger, fatigue, spasms, loss of consciousness—symptoms best treated by intravenous injections of grape-sugar. Other Viennese observers have also had excellent results with this remedy. Rapid improvement of patients in a comatose condition was seen several times. The excretion of sugar and acetone can be promptly reduced to a fraction of the regular output. Insulin cannot supersede the dietetic treatment of diabetes, but the new method is a most welcome addition to the physician's equipment. Insulin is being prepared in three laboratories in Vienna, as it is too expensive to be imported from abroad. Physicians are agreed, however, that the English product is much better than that hitherto obtainable here. Dr. Pollak pointed out that the increase of weight noted in patients submitted to that treatment is due to water-retention in the tissues, and that all patients benefit by being allowed fat and carbohydrates.

Influence of Diuretics on Water Content of Tissues.

Dr. Saxl has investigated the influence of diuretics upon the tissues in healthy and diseased persons in order to clear up the conflicting evidence found in the literature of the subject. As a rule, healthy tissues are only slightly affected; theobromin, for instance, does not increase the flow of urine in children (Hecht), whilst novasurol is very effective. In œdematous patients diuresis was supposed to be produced by direct attack upon the œdematous tissue. Experiments by Schur show, however, that purin bodies do exert a very definite action on healthy kidneys; Schur thinks that they act chiefly on the kidney and not by mobilising the water contained in the tissues. In a recent discussion on this problem at the Vienna Medical Society all these hypotheses were brought forward; the majority of the investigators agreed that the chief burden is assumed by the kidney. All diuretics should be capable of stimulation of the function of the kidney. The idea that water might be "drawn out" of the tissues cannot now be upheld. It is the vis a tergo which causes large anasarca to disappear under the influence of a diuretic remedy, increased pressure by improved heart action being one of the chief factors. The influence of the nervous system upon the kidney must not be lost sight of, because the same remedy acts in one case and fails to act in another.

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[1] The Journal of Laboratory and Clinical Medicine, July, 1923, p. 631.

[2] Reported in Jour. Biol. Chem., 1921, xlviii., 51.

General Systemic Effects of X Rays.

The effects of X rays upon the general condition of patients who had for various reasons received large doses of them were recently studied in Prof. Schlesinger's clinic. In nearly every instance marked debility and malaise appeared similar to that following intoxication, and sometimes so severe as to give the appearance of shock. This condition, expressed by an abnormal distribution of blood and changes in the permeability of the blood-vessels, was quickly improved by hypertonic solutions of sugar, NaCl or Na_2SO_4, this being very similar to improvement observed in actual shock. Further investigations have shown that not only is NaCl largely eliminated from the blood after a strong dose of X rays, but also that the concentration of potassium, calcium, and cholesterin in the blood is profoundly altered, while the blood-sugar reacts sharply. Lymphatic tissue is also severely affected, and the products of this disintegration are no doubt partly responsible for the symptoms of intoxication after X ray application. Every exposure to X rays which penetrate through the superficial layers must, therefore, be regarded as a systemic injury first manifested by the transportation of NaCl from the blood to the kidneys and thence out of the body. One of the organs primarily affected is the liver, which soon shows parenchymatous changes. This organ may be "absolutely insufficient" to deal with the work thrown upon it even by a small quantity of X rays, or "relatively insufficient," if an intensive dose has caused a large amount of disintegration products to be circulating in the system. The liver may thus be seriously affected, not by the rays themselves, but by the metabolic changes caused in the blood. The normal function of other glandular organs may also be seriously hampered after an X ray application to the body, but all evidence points to the liver as the chief sufferer, hence the malaise and prostration so often complained of after X ray sittings. The change in salt concentration is only part, however, of the damage done to the system; it is readily counteracted by giving the patient an adequate dose of NaCl, whilst other damage is not yet easily recognised or treated.

July 31st.

BUDAPEST.

(From our own Correspondent.)

Treatment of Terminal Hæmaturia.

In a recent number of the *Gyógyászat*, Dr. Kertész, of Budapest, dealt with terminal hæmaturia as one of the most obstinate symptoms of gonorrhœa. This hæmaturia always occurs after micturition, and results from the strain which serves to express the last drops of urine. The blood exudes from wrinkles formed between the bladder and the urethra, which wrinkles are exposed, about the end of micturition, to a certain tension; their epithelial surface is mostly excoriated, and during the frequent contractions connected with pressure they void a few drops of blood. Methods of treatment hitherto applied—rest in bed and instillation of silver nitrate—are frequently of no avail. Another more efficacious method consists in letting the patient micturate in a half-recumbent position, instructing him when the act is nearly concluded to relax muscular pressure and to press the bladder hard with the hands. In this way the last drops of urine are expressed. This method is very serviceable, often relieving the patient from terminal hæmaturia in a few days.

Neosalvarsan in the Treatment of Chorea.

Dr. János Bókay, professor of diseases of children at the University of Budapest, has lately administered neosalvarsan in severe cases of chorea with excellent results. A striking relief of incoördination a few days after the first intravenous application of neosalvarsan, and disappearance of the intense nervous restlessness in every instance after the second injection—i.e., after ten days—have been observed. The quantity of neosalvarsan given varied; Dr. Bókay used a dose of 1 g. on an average. Up to now, chorea in a child of "middle" age could generally be cured by oral application of some 300 drops of Fowler's solution, with an arsenic content of about 0·12 g. The arsenic content of 1 g. neosalvarsan is 0·217 g. Prof. Bókay attributes the rapid effect of the latter not to the greater arsenic content, but to the fact that the arsenic in the neosalvarsan is organic and also lipotropic, making possible the penetration of the arsenic into nerve tissue.

Death of an Eminent Ship's Surgeon.

Dr. Francis Gáspar, who died recently, was well known for his books of travel, and served about 40 years with the late Austro-Hungarian marine as a ship's surgeon. He published his experiences in two large works, "Seven Years on the Sea," and "Forty Thousand Miles with Steam and Wind"—i.e., 200,000 English miles—both of which were translated into several foreign languages. After the war, when the Austro-Hungarian marine service disappeared, Dr. Gáspar accepted the offer of an important post in the Hungarian Public Health Department, but found the work distasteful, and became embittered to such an extent that he committed suicide.

A Wheat Currency.

The Hungarian doctor's livelihood at the present time is precarious, especially in the provinces, where a village practitioner's annual income rarely exceeds 100,000 kronen (at present equivalent to something over 45s.). The instability of the economic situation has led the local branch of the Medical Association at Szabolcs to introduce a new system of payment of medical fees. The fee for a consultation is to be the current price of 5 kg. of wheat. Even this very moderate fee will be reduced for officials, clerks, &c., whose salaries do not vary with the fluctuations of the price of wheat.

Census Figures.

The Central Statistical Bureau has just published the data yielded by the last census. Hungary is stated to have had 7,980,143 inhabitants in 1920, which figure represents a 5 per cent. increase against 1910 in the present Hungarian territory. This increase of population, despite the tremendous loss of life in the war, is due to the influx of people from the lost portions of the old Hungarian kingdom. Another result of the war was that the male population numbered 3·8 millions and the female population 4·1 millions. The number of widows in the country was 25 per cent. larger than in 1910, and the number of divorces had increased by 55 per cent.

Child Welfare Exhibition.

On July 16th the first Hungarian Child Welfare Exhibition was opened in Budapest. The exhibits were divided into various groups—hygienic, educational, &c. A large collection of apparatus for the correction of deformities, a number of skulls of children from the pathological museum of the pædiatric clinic, a series of models illustrating the different infections of childhood, and statistics relating to children's accidents were among the most interesting features of the exhibition.

July 27th.

The late Dr. J. R. Stenhouse.—The death occurred at St. Andrew's-place, Lewes, on August 10th of Dr. John Robert Stenhouse at the comparatively early age of 52. Dr. Stenhouse received his medical education at Guy's Hospital, becoming M.R.C.S., L.R.C.P. Lond. in 1894, and B.S. Lond. in 1895. He secured the diploma of Public Health in 1904 and obtained the degree of M.D. (qualifying for medal) in 1907. Dr. Stenhouse held a number of appointments at Lewes, including those of school medical officer and medical officer of health, but ill-health compelled him to relinquish the latter post some years ago. He was an occasional contributor to the medical press.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(Continued from p. 304.)

SECTION OF MEDICINE.

WEDNESDAY, JULY 25TH.

IN opening the discussion, before a crowded audience, on

Diabetes,

the President, Sir THOMAS HORDER, said that the committee of the section had had no difficulty in choosing the subject of the first debate. If insulin were not discussed our patients would be much surprised, and with good reason, and they would probably assume, and again with reason, that we were quite satisfied that in insulin we possessed a "cure" for diabetes and that nothing more need be said on the subject. Many persons had already assumed this in view of certain generalisations which, if they did not carry the hall-mark of authority, had not been authoritatively contradicted. It was notoriously difficult to control popular ideas about new remedies, and the very fact that such epoch-making events as the discovery of insulin were rare, when they did come, took popular credence further than facts justified or the discoverer claimed. The problem was regarded as already solved, whereas it might well be that insulin would prove to be as great an asset to medical science by assisting the interpretation of obscure phenomena as in the provision of a therapeutic agent. Had not the essence of the problem of diabetes been the almost certain fact that we were dealing not with one biochemical change but with several? Certain cases of diabetes were benefited much less by insulin than were others, and certain would be found not to be benefited at all; this position must be made quite clear in our patients' interest.

Some very fundamental questions, Sir Thomas Horder continued, will be discussed, and we shall hear the opinion of men well qualified to speak upon them. Will some of the cases of diabetes that show such striking improvement under treatment by this remedy recover their lost power of maintaining a normal blood-sugar so as to "carry on" without its help? Is diabetes necessarily a progressive disease? At what level should the blood-sugar be maintained in order that insulin should be most effective? Will blood-sugar estimations continue to be necessary in every case, and, if so, are either of the rapid methods at present in use practicable and accurate for the general practitioner? Will it be a safe criterion by which to control an increase in the patient's diet to adopt the estimation of urinary sugar? Can any general guide be given as to the best proportions of the main food principles which it is wise to employ in venturing upon an increase of diet when, by the use of insulin and by starvation, the blood-sugar has kept within a normal range for several days, or must each case be regarded as a law unto itself? Is there not a hope that the active principle of insulin may be isolated so that it may be effectively given by the mouth? We shall doubtless hear of the abuse of insulin by the greedy glycosuric and of the undesirable symptoms produced by the use of insulin in cases of renal glycosuria. It would be a vain request to ask that in this discussion some consideration should be given to other aspects of diabetes than those concerned with insulin: the relation of sepsis to diabetes, the ultimate causation of pancreatic cases, the influence of infection and heredity. Insulin is probably the greatest contribution yet made to the study of diabetes. The section extends a very hearty welcome to Dr. Banting, and he will be asked to speak first. If he has anything new to tell us we shall be very interested to hear it. If he has nothing new then we shall like to hear the old story again from his own lips.

Dr. F. G. BANTING (Toronto) said that he and those associated with him in his work thanked the medical profession for the way in which it had received the result of their experiments. He outlined the story of the research which led to the preparation of insulin in quantity. Following ligature of the pancreatic ducts the acinous cells of the gland degenerate, but the islet cells remain intact. They had ligated the ducts in a dog and ten weeks later removed the degenerate pancreas and extracted it with saline. The injection of this extract into a diabetic dog caused a fall in the animal's blood-sugar and it lost its ravenous appetite. The amount of pancreas so obtained was very small. The injection of secretin to exhaust the acinous cells was found to be very uncertain in its results. Up to the fourth month of intra-uterine life the acinous cells in the fœtal calf contain no trypsinogen granules. An extract of this material was found to be very active in lowering blood-sugar. An attempt was then made to extract whole pancreas with some chemical substance which would destroy trypsin but leave insulin unharmed; 82 per cent. alcohol was found to answer the purpose. Since then rapid progress has been made and the product is now protein-free, is non-irritating, and easily standardised. In the laboratory insulin in proper dosage reduces the blood-sugar to normal or less, renders the urine sugar-free, and by its use the life of a depancreatised dog can be greatly prolonged. Insulin also enables the liver to store glycogen. In adequate doses insulin will control all forms of hyperglycæmia.

Clinically there is no fixed method of managing diabetic patients. In Toronto a case, if at all severe, is admitted to hospital for at least three weeks' training and the working out of sugar tolerance. The patient is kept on his usual diet for 24 hours and then upon the "basal requirement diet"; 0·75 g. of protein per kilo body-weight is given to an adult per diem, the remaining calories are made up of carbohydrate and fat. A mild case on this diet becomes sugar-free; if severe the output becomes more constant. If the patient can take 500 calories over and above the basal requirement insulin is not given. The sugar output is of value in estimating the initial dose of insulin. One unit will metabolise from 2 to 2·5 g. of carbohydrate in a severe case and from 5–6 g. in a mild case. As a rule, 5 units may be given to begin with unless the patient is comatose. The dose should be given one hour before a meal once a day. It is advisable to keep the patient sugar-free, as in that state the pancreas tends to produce insulin. In many cases there is evidence of increasing tolerance as a result of treatment with insulin. The frequency of blood-sugar estimation necessary to control treatment is still uncertain.

Dr. P. J. CAMMIDGE (London), after expressing his personal admiration for Dr. Banting's work, said that for many years the name diabetes mellitus had been applied to any condition of glycosuria. It was now possible to determine with considerable certainty whether the symptom depended on failure of the pancreas or was due to other known causes of hyperglycæmia. Clinically the prognosis and reaction to treatment of the various types was different. He had applied the test of "hydrolysis and difference values" of the blood to its sugar content before and after a standard breakfast. In this test the blood-sugar is estimated in one sample and in another the reducing power is determined after being freed from protein and hydrolysed. The latter gives the "hydrolysis value" and the difference between the two is the "difference value." By this means three types have been differentiated, characterised respectively by deficiency of the internal secretion of the pancreas, hyperactivity of the thyroid, pituitary or nervous disturbances, and defects of carbohydrate storage in the liver. Combinations of these types were met with, but deficiency of islets develops in all untreated cases of hyperglycæmia. Insulin may be used in treatment in three ways: as a temporary aid to metabolism in emergencies, to enable a patient to take a diet in excess of his natural tolerance and as a remedial measure. It is not a universal cure for diabetes, but is the most valuable means we have for controlling metabolic defects due to deficiency of the internal secretions of the pancreas and should not be given indiscriminately to all cases of glycosuria.

Dr. George Graham (London), speaking on the results of experiments on patients in the medical professorial clinic at St. Bartholomew's, said tolerance could be recovered to a certain extent by resting the islet cells. It was of the utmost importance to make certain that as a result of treatment the blood-sugar was normal in the morning before the daily dose of insulin was given and no carbohydrate beyond that in the vegetables must be added until the morning blood-sugar had been normal for three or four weeks. If the blood-sugar was 0·2 per cent. or 0·15 per cent. the islet cells were overworked and had no chance to repair. In order to produce this a varying dose will be required in different individuals; in some 10 to 15 units a day would suffice, in others 30 to 50 units even twice a day might be required. Blood-sugar estimations were of assistance, but not absolutely necessary: so long as glycosuria occurred they could be dispensed with, but when the urine was sugar-free it was important to make estimations occasionally as there was no other means of telling whether it were 0·10 per cent. or 0·18 per cent. Blood should be collected either before the insulin injection or 12 hours after. It was better to estimate the blood-sugar at once, but the blood might be collected and preserved by the addition of potassium oxalate and one drop of 40 per cent. formalin. Results of treatment in cases of coma were, so far, fairly good; two recovered and one died. It was important to hunt for sepsis in every case; the fatal case had a parotid abscess. In coma 20 to 30 units should be given subcutaneously at once; it was unnecessary to give sugar if the patient was passing much sugar, but if very bad 50 g. of sugar and 60 units of insulin should be given at once, and as much as 140 units may be required in 24 hours.

Dr. J. A. Nixon (Bristol) said he had treated five cases of diabetes with insulin, and spoke enthusiastically, though perhaps prematurely, as to its value. Was a patient any better, he asked, for being sugar-free when he had a high blood-sugar? The patient may gain in weight and well-being, but was he safe? If glycosuria occurred with a low blood-sugar threshold we could make use of a trace of glycosuria as a guide to insulin dosage. Symptoms due to hypoglycæmia were difficult to determine. A man of 40 received 20 units of insulin daily for three days and then suddenly developed partial aphasia; he was given glucose and speech improved the next day, but as he had had angina pectoris the aphasia may have been of vascular origin. Another man, aged 35, receiving 20 units complained of tingling in the legs and swelling of the feet though his blood did not show hypoglycæmia. The "basal requirement diet" was the most practical standard diet (Woodyat formula), which enabled insulin dosage to be adjusted to a diet which was adequate.

Dr. John Rennie (Glasgow) contrasted the results of treatment of a series of cases under the old, the Allen-Graham, and insulin methods of treatment. An improvement may be expected in the majority treated by the Allen method, but end-results were far from satisfactory. Ten cases treated with insulin showed distinct improvement. To determine the requisite dose of insulin each patient was given a meal of known carbohydrate protein fat content with increasing doses of insulin until satisfactory blood-sugar and urinary-sugar results were obtained, and from this a sufficient dose for an adequate diet was calculated. This method was best suited to chronic cases with low carbohydrate tolerance. There was no experimental evidence to show that insulin was absorbed through the skin.

Dr. E. P. Poulton (London) said that in certain cases a distinct increase of tolerance had been observed after prolonged treatment with insulin.

Dr. O. Leyton (London) referred to the curative properties of insulin in diabetes of comparatively recent origin and due to pancreatic defect. When there was a probability that damaged islet cells were present an attempt should be made to restore them to health by rest—i.e., giving enough insulin to make blood-sugar below rather than above normal; if symptoms of hypoglycæmia result they may be controlled by the administration of sugar.

Dr. A. P. Thomson (Birmingham) had observed a definite increase in tolerance in two cases that had previously been vigorously dieted for some time. Blood-sugar estimations were essential when giving large doses of insulin, but treatment can well be carried on without in the average case if the urine were examined frequently and the diet properly controlled. A few estimations were necessary during a preliminary period of standardisation.

Dr. Frank Roper (Exeter) related some recent experiences with insulin, and Dr. E. E. Waters, I.M.S., and Dr. A. Clarke Begg (Swansea) took part in the discussion before Dr. Banting's reply.

Thursday, July 26th.

On the second day the section, under the chairmanship of Dr. J. Odery Symes (Bristol), discussed

Heart Disease in Early Life,

its ætiology, prevention, and treatment. Dr. Reginald Miller (London) said the matter was of prime importance for the people of England. The subject resolves itself largely into the consideration of one disease, and that is acute rheumatism. In reviewing the progress made in the fight against this disease the chief change in the last 50 years seems to be a reduction in the frequency of its severer manifestations; hyperpyrexia, the most dread of all rheumatic symptoms, seems to be disappearing, and the number of cases of rheumatism sufficiently severe to require admission to hospital is also declining; in the last 50 years the admissions have dropped 50 per cent., according to the statistics of some London hospitals. The incidence of acute pericarditis as judged from the same tables is also declining. Some progress, therefore, appears to have been made, and it is due rather to clinical work than to public health administration; earlier diagnosis and more efficient treatment being in the main responsible. But rheumatism still remains one of the serious infections of this country, and the factors hindering progress are numerous, and may be considered under three headings.

1. *Problem of Rheumatic Infection*—the most important. The modern view is that it is a specific infection producing no sort of immunity against itself. A disease reproducing the same clinical picture again and again must be due to one type or strain of microbes; the histopathology proves the bacteriæmic character of the infection and supports its specific nature. To gain more knowledge as to the influence of the rheumatic environment it might be of service to make rheumatism a notifiable disease, and education of parents and school teachers would further our efforts to get the rheumatic child under treatment as early as possible. As to the specific organism, the view was expressed that it is an alimentary streptococcus, one fact brought forward in support being the isolation of such an organism from the cerebro-spinal fluid in a case of chorea. The action of salicylate was discussed and the view expressed that it exerted a bactericidal action; the effective dose in children is from one to two drachms a day divided into many small doses. As to the origin of the recrudescences of the infective process and reinfection of the rheumatic, early attacks may often be traced to the tonsils and tonsillectomy may do good, but the source of later attacks is often wrapped in mystery. The tests of cure are the loss of the toxic appearance, a gain in weight, and a flat temperature chart.

2. *Problem of Heart Disease in Rheumatic Subjects.*—Heart disease in rheumatism is largely a matter of the severity of the infection and the age of the child; below 12 rheumatism is essentially an infection of the heart. The severe symptoms often develop with a

rush, yet they are nearly always preceded by mild symptoms. The activity of the infection must be subdued by salicylate, while sparing the heart by rest, early diagnosis, and efficient treatment.

3. *Problem of Cardiac Crippling in Rheumatic Heart Disease*—the chronic heart invalid. The heart muscle loses its power of recovery. It is infection rather than mechanical strain that has done the harm; the child's heart never breaks down by mechanical strain alone, and these cases of chronic cardiac disease are the result of repeated infections. In preventing and treating chronic cardiac insufficiency reliance must be placed on the persistent use of salicylate in the hope of preventing recrudescences of infection, the use of digitalis when indicated, and removal of tonsils obviously diseased. Vaccine therapy, even as a prophylactic, in spite of recent reports with *S. viridans* from America, is most disappointing. With children too toxic to react the infection produces no immunity to itself. Sir A. E. Wright's new method of transfusion with immunised blood may be well worth a trial. The provision of prolonged quiet rather than strict rest, correct hygiene, close medical supervision, and some facilities for education should be aimed at. The most urgent problems awaiting solution are: (1) What is the underlying connexion between rheumatism and poverty? (2) What is the origin of repeated relapses and how can they be prevented? (3) How can we give long courses of treatment to our many heart cripples?

Dr. G. A. **Allan** (Glasgow) said that in 1921 53,710 deaths, or 11·7 per cent. of deaths at all ages from all causes in England and Wales, were due to heart disease. Rheumatism accounts for about half to one-third of deaths due to heart disease in a general hospital. In Glasgow, with a population of 1,111,428, the education authority is responsible for 198,304 children, and in routine examination 0·6 per cent. had acquired organic heart disease, and 1·1 per cent. functional heart disorder. In London 4 per cent. of girls and 3 per cent. of boys of 12 years of age have a cardiac disorder. There must be between 45,000 and 50,000 children attending school in Great Britain who have organic heart disease, many of whom are destined to become cardiac cripples before middle life. The percentage of cases doubles during the compulsory school age. Rheumatism was an infection, but an organism did not necessarily have to be seen before it could be fought. Was tonsillitis a rheumatic manifestation, or was the tonsil the site of entry or the home of the organism? Did scarlet fever ever produce heart disease or predispose to rheumatic infection? With our present knowledge some education of parents was possible. Many do not realise a child could have rheumatism. Education of students should be more thorough, and they and practitioners should realise that treating rheumatism by pharmacopœial doses of salicylate is only playing with a serious disease. End-results of rheumatism as seen in general hospitals were very seldom the result of only one attack; cases of pericarditis in a first attack do not as a rule live long. We wanted to know the habitat of the organism and the predisposing factors to the disease. A committee linking up various workers would be in a position to influence medical and lay opinion in the direction of most useful activity. It was proposed that the council of the association be recommended to appoint a special committee to consider the best steps to be taken to combat the grave menace to the community arising from chronic cardiac disease.

Dr. J. G. **Emanuel** (Birmingham) said that to a child suffering from organic heart disease the danger is not from over-exertion but from re-infection. Rheumatic carditis demands rest in bed. If no active infection was present a damaged heart required exercising. Rheumatic carditis often ran an afebrile course. Anæmia might be too slight to be a guide. and the same holds for the loss of weight. Physical signs, with the exception of pericardial friction, did not help us to recognise active cardial infection. A pulse-rate over 100 when the child was at rest in bed, especially if not slowed by digitalis, indicated active infection. Re-infection did not take place through the tonsil. Rheumatism in children closely resembles tuberculosis; in both repeated infection took place from existing foci within the body. Salicylate had not diminished the incidence of rheumatic carditis; it relieved pain and pyrexia in this and other conditions. There was a danger in its administration, in that by relieving pain and fever the child might be allowed up too soon. Hospitals, auxiliary to existing general hospitals, were badly required where children might lie until all infection was over.

Dr. **Carey Coombs** (Bristol) protested against Dr. Emanuel's anti-salicylate views in the treatment of cardiac rheumatism. Mortality records of Bristol proved the incidence of fatal cardiac rheumatism to be less than it was; in that city about 80 deaths occurred each year—in each case death might be preceded by, perhaps, ten years' crippledom. He welcomed Dr. Allan's resolution. Many cases of cardiac rheumatism became relatively cured, but the valve was always damaged and liable to become the seat of chronic ulcerative endocarditis. He warmly endorsed Dr. Emanuel's plea for treatment in auxiliary hospitals in coördination with existing teaching hospitals, and thought much might be done at once if Poor-law infirmaries were more readily available for the purpose.

Dr. W. H. W. **Attlee** (Eton) said that in public schools hearts crippled by rheumatism were very rare, but large numbers of functional hearts were met with wherein abnormal signs were found in the course of routine examination but which gave no symptoms. Variation from the normal physical signs in the heart of a rapidly growing boy meant very little in the absence of symptoms. Restriction of games in such cases does harm to the patient, and school life is spoilt to a great extent. He had followed up many cases which had hearts of this kind at school, and none had shown cardiac symptoms since leaving school.

Dr. M. O. **Raven** (Broadstairs) said that fresh air was necessary, and ordinary convalescent homes were too noisy for the treatment of children with heart disease. In rest homes at the seaside one had to decide how long a child was to be kept in order to prevent recrudescence. In New York it was considered that the child was not free until three years had passed without relapse. Of cases treated at Broadstairs 19 had been traced through periods of 18 months; these had remained for periods varying from six weeks to 12 months and were re-examined after living active lives in London for at least seven months. The result suggested that children were subject to relapse in proportion to the shortness of their stay in the country. Every child who ever had symptoms of the rheumatic state should be sent into the country for six to eight months before being re-exposed to the environment in which the disease was originally contracted. Routine rest was always to be deprecated. Rest is needed solely if infection was in the heart. A systolic murmur often disappeared with rest. A diastolic bruit at the apex was very common in children with active heart disease; its first manifestation was a reduplicated second sound which gradually became a mid-diastolic bruit and finally a pre-systolic murmur. On rest the murmur might recede completely. Until change in physical signs has ceased rest must be enforced.

Dr. F. G. **Layton** (Walsall) said that when patients were ordered by a hospital physician to bed for a month on account of rheumatism the general practitioner should be written to and asked to enforce that treatment and the administration of salicylate. What was the evidence that growing pains were due to rheumatic infection? Morbus cordis undoubtedly followed scarlet fever and diphtheria. Heart disease in children was much commoner in the back streets and far more hospital accommodation was wanted.

Dr. C. O. **Hawthorne** (London) emphasised the importance of prophylactic efforts, but did not approve of leaving propaganda work to a special committee and thought it should be done through the general practitioner. There were two pictures of rheumatic infection, the adult and the child—rheumatism in adults compels rest on account of arthritis, but the non-arthritic rheumatism of childhood did not enforce rest and for purposes of prevention rest must be secured. Leaflets for propaganda purposes were useless.

Dr. A. P. Thomson (Birmingham) reviewed his personal experience during the last two years in dealing with the problem of the rheumatic child at the Barberville institution in Birmingham—a residential school for cripples wherein some 50 per cent. of the beds were allocated to rheumatic cases. The outstanding clinical difficulties were two: to determine when the cardiac infection had become quiescent and when the child became free from the danger of re-infection. Cases of chorea did better when special educational methods were employed than when they did not go to school. By varying the daily amount of rest he found that one group, if rested for 18 hours in the 24, developed a more rapid pulse than those who were up; if a child was put to bed and his pulse-rate rose he should be exercised. Carditis does not develop when weight is going up. Rheumatic cases should be certified and treated in special institutions in touch with the medical schools.

Dr. E. J. Moffett (Birmingham) said that the type of case met with now was milder than in the nineties. As a school medical inspector she found difficulties in diagnosis between the effects of tubercle and rheumatism. The Birmingham mothers are well up in all symptoms of rheumatism. Treatment in the poorer classes was unsatisfactory. Severe cases are admitted to hospital; in less severe cases home treatment was attempted under the supervision of a school nurse. Long periods of continuous treatment are required. Education was important; rheumatic children were backward from prolonged absence from school and should be taught separately in smaller classes on a modified Delton plan. The gap between the curricula between the infant and other schools was too wide.

Sir Thomas Horder commented on the significance of the diastolic bruit in rheumatic heart disease, stressing its importance as a premonitory sign of mitral stenosis. Mitral stenosis differed in its evolution from mitral regurgitation; the latter resulted from acute endocarditis, a complication of rheumatic fever, whereas most cases of mitral stenosis followed not an acute endocarditis but a chronic, often afebrile, sometimes subacute, rheumatic process. Mitral regurgitation was a vegetative affair of the cusps: stenosis an infiltration of the valve.

Dr. G. J. Langley (Manchester) said that the recognition of subacute rheumatism in children might be exceedingly difficult. He drew attention to the parallelism between tuberculous and rheumatic infection; both might improve on graduated exercise, though the response to effort of the rheumatic streptococcus and the tubercle bacillus was not the same. The response of the rheumatic patient to auto-inoculation was recognised in the form of a recrudescence of the disease; in tubercle the response was often recorded on the temperature chart.

Dr. C. F. Routh (Southsea) commented on the difficulty of tracing the origin of valvular defects in adults who were not aware that they had organic heart disease; a child's heart had an extraordinary recuperative power. Acute rheumatism was very rare in private practice.

Dr. R. Whittington (Hove) agreed with Dr. Attlee that properly regulated exercises were greatly to be preferred to forbidding games to boys at school.

Dr. Miller, in reply, said that he thought Dr. Attlee's cases were not infected or poisoned hearts and should be treated on a nervous rather than a cardiac basis. Swimming was not good exercise for functional cardiac disorders. Agreement was general as to the value of salicylate and the necessity of rest for the infected heart, and he was glad that the meeting felt the time had come for some investigation into the rheumatic problem to be made.

Friday, July 27th.

On the third day Dr. G. A. Allan was in the chair and Dr. J. J. Perkins (London) opened a discussion on

Chronic Bronchitis.

The subject, he said, had been chosen at the request of the branches on account of the frequency of these cases in practice and their high death roll—1010 persons per million living (R.G.'s figures for 1920). Dr. Perkins outlined the main predisposing causes—trade and occupation, climate, local pathological conditions especially in the upper respiratory tract, general constitutional factors. There was a distinction between recurrent bronchial catarrh and a single acute attack of bronchitis, which latter may occur without special predisposing conditions, and for which ordinary drugs were useful and vaccines truly curative. When catarrh is constant vaccines were more efficacious in relieving such symptoms as cough or spasm than in curing. Chronic bronchitis was usually secondary to some chronic pre-existing disease, especially of the upper respiratory tract, from which infection of the bronchi by inhalation could easily take place, and the eradication of this underlying condition was essential to the successful treatment of the bronchi. In other cases metabolic conditions were predisposing factors—obesity, over-feeding, and alcoholic excess. Treatment should be continued until a satisfactory convalescence was secured. The open-air habit of life should be preserved or restored and a good plan for the bronchitic was to take his annual holiday in the winter at a place where outdoor exercise is pleasant. The conditions of life in office and home could be improved and heated stuffy atmospheres abolished. A valuable adjunct was respiratory exercises such as those systematised by Mr. C. MacMahon at St. Bartholomew's Hospital, the object of which is to restore and increase the movement of the lungs.

While not undervaluing our present methods of treatment, Dr. Perkins suggested, in conclusion, that important predisposing conditions were often present, the treatment of which was essential; that medicinal measures did not cover the whole ground; that it was important by pure air and exercises to increase the functional activity of the lungs. By removing foci of infection much could be done to prevent catarrh. After an attack much could be done to defend the patient from becoming a chronic bronchitic by enjoining the value of fresh air and exercise of the lung.

Dr. Symes discussed the bacteriology and vaccine treatment of chronic bronchitis. In the infective varieties reports were universally favourable; cases were never made worse. He was opposed to the use of stock vaccine, and mixed infection being the rule an autogenous vaccine was highly desirable. The exciting organisms were constantly present in the nose and may be isolated by means of a nasal swab when sputum cannot be satisfactorily obtained. The dose must be sufficient to excite a reaction and repeated every five to seven days. In the interval between attacks stock prophylactic vaccine might be given.

Dr. Michael Foster (Harrogate) described climatic treatment abroad. The first question was, Can the disease be arrested? Too little consideration had been given to these early cases drifting into lifelong bronchitis, and in these early cases climatic treatment enables habits of coddling to be set aside. Dry air lessens secretion and the diminished air pressure of the Alps dilates the alveoli gently and may be of great value in the winter in early cases; insomnia is generally aggravated by high altitude and the chest wall must not be rigid. Spa treatment afforded another useful method of benefiting early cases. When bronchitis was firmly established the treatment must aim at diminishing secretion—warmth, absence of fog, and dry air, though some are helped by a moist climate when cough was hard and sputa scanty. The Western Riviera was drier than the Eastern; patients with scanty expectoration were probably better off at Rapallo than further East. Egypt is ideal for certain months for cases with profuse expectoration;

asthma cases should not be at sea-level; as small an elevation as 100 ft. might make all the difference as to frequency of paroxysms.

Mr. G. SECCOMBE HETT (London) said that all the cases of chronic bronchitis which he saw were descending infections from the upper respiratory tract. Children with bronchitis usually have a poor air way through the nose and infected tonsils and adenoids. Deflected septum induced nasal catarrh and nasal sepsis. Undue patency of the nose also induced nasal sepsis and a descending infection. Tonsillar infection in adults was less likely to produce bronchitis than nasal infection, but infected teeth should always be removed. Chronic bronchitis was very apt to follow asthma and hay fever because swelling and hypersecretion in the upper respiratory tracts sooner or later allows of infection. Removal of polypi, not in themselves the cause, might relieve bronchitis and asthma by promoting drainage of infected ethmoidal cells.

Dr. A. C. INMAN (London) said that every case of chronic bronchitis should have the sputum examined for tubercle bacilli, and the possibility of a syphilitic infection must always be borne in mind. From a bacteriological point of view the most important organisms were streptococci and *B. friedländer*. In the treatment of the latter infection vaccine was very useful, in the former disappointing. Preventive inoculation should be carried out during periods free from catarrh.

Prof. E. L. COLLIS (Cardiff) wrote that chronic bronchitis contributed so much to sickness and death that it was facile princeps amongst disease, especially in later life. It was probably responsible annually for 80,000 years of invalidity and 28,000 deaths. The death-rate has been falling rapidly since 1870. The disease is induced by wintry weather and atmospheric pollution; a chronic traumatic origin was commoner than an infective. Reduction in morbidity and mortality may be expected to follow (*a*) such social uplift as increases the health of lower grades of society, and (*b*) smoke abatement in industrial districts and great towns.

Dr. F. G. LAYTON said the belief in magic was not yet dead; he had recently come across a boy suffering from pulmonary disease who had a sheep's lung tied to each foot.

Dr. FLORENCE STONEY (Bournemouth) drew attention to dental sepsis as a cause of chronic bronchitis.

Dr. ASTON KEY (Portsmouth) said that one of the great troubles was that the bronchial mucosa was incapable of repair. It was true that many cases of bronchitis arise from obstruction to the nose, and such always succumbed to bronchitis whether the nose were operated upon or not.

Dr. G. B. BATTEN (Dulwich) gave his experience during 37 years of general practice. In the old days chronic winter bronchitis was very common and difficult to treat, the old ladies being overdressed and living in stuffy atmospheres. The introduction of the fresh air treatment of tuberculosis was a great help and these patients were weaned from stuffy rooms and overclothing to fresh air habits, and he now knew of no individual who had habitual winter bronchitis. The important thing is to make the patient live out of doors.

Dr. HYLA GREVES (Bournemouth) said chronic bronchitis was usually a secondary infection rather than a primary one, and constitutional disorders such as gout, arterio-sclerosis, renal disease, and peribronchial tubercle were common underlying factors. In treatment climate plays an important part, and the south of England provided many suitable resorts. The resistance to cold should be gradually cultivated. In acute and subacute cases dry cupping of the bases of the lungs was a valuable agent.

Sir THOMAS HORDER stressed the importance of such underlying constitutional disorders as gout, hyperpiesis, myxœdema, and other endocrine disorders. All cases of bronchitis were not infective; in some infection plays but a minor part, and this explained the success of vaccine in one class and its failure in another. Cases of "mucous diathesis" whether involving the respiratory or alimentary tracts were very difficult to treat. Mucous bronchitis was intermediate between the paroxysmal type (asthma) and the true infective types. It was very important to treat the nervous cardiovascular and digestive systems in such patients.

Dr. DONALD HALL (Brighton) said that he had found autogenous vaccine of value and had had a very mixed experience of operative treatment in the upper respiratory tracts.

Dr. PERKINS, in reply, said that he was satisfied with the result of the discussion. The fact that chronic bronchitis was usually secondary had emerged and the importance of educating people to an open-air life was well recognised.

SECTION OF LARYNGOLOGY AND OTOLOGY.

THURSDAY, JULY 26TH.

THIS combined section met on two days under the presidency of Mr. E. B. WAGGETT. In opening a discussion on

Internal Ear Deafness

Dr. DAN MCKENZIE (London) began by deploring the disparity between our anatomical as opposed to our pathological knowledge of the labyrinth. He described the well-known difficulty of assessing the value of tuning-fork tests in deciding whether the case was of middle or inner ear deafness. With regard to obstructive deafness, nobody had thrown doubt upon the correctness of the inferences to be drawn; but he described a case in which all the classical science of nerve deafness were present in which removal of impacted cerumen was followed by immediate cure of the deafness. Mixed deafness was the commonest type of all, and the affection of the labyrinth in these cases might be merely a functional derangement. The commonest cause of nerve deafness was middle-ear disease; this was a fundamental point and based on statistics from his own practice. The prognosis of nerve deafness with middle-ear disease was grave unless the latter could be arrested. Myxœdematous deafness was a mixed type but happily yielded readily to thyroid medication if begun early. He next dwelt upon the relation between the vestibular reflexes and nerve deafness; they co-existed in acute labyrinthitis, though rarely in a chronic labyrinthitis. He had not seen vertigo in the sudden deafness that occurs in mumps. Vertigo might attend upon almost any type of disease, whereas tinnitus was usually tympanic. Having dealt with noise-deafness, senile deafness, syphilitic and toxic deafness, he concluded by sounding a note of hope provided that means could be found for encouraging pathological research of the type so well exemplified in J. S. Fraser's work.

Thirteen speakers took part in the discussion. Mr. W. M. MOLLISON (London) grouped deafness into qualitative and quantitative. In the qualitative types, obstructive or perceptive, there was a loss either of the upper or lower tones, whereas the remainder of the scale was unaffected. In quantitative ear trouble there was an alteration all along the line; some of the quantitative cases were familial, some toxic, and some due to depression or elevation of sensitivity. Unlike the opener, he had seen vertigo with the sudden deafness of mumps. He mentioned the relation between Paget's disease and nerve deafness, and gave notes and radiograms of a case. He dwelt upon the importance of the lowering of the upper tone limit in diagnosing between middle and internal ear deafness, and of the use of the monochord both by air and bone conduction. He described cases of astounding acuity of hearing in the blind and in certain types of neurasthenics, where whispers could be heard round several corners. Similarly, hypersensitivity of the canals was a clinical entity. Perhaps the canals were getting less valuable to man, and this hyperacuity in neurasthenics was a want of progress in the acquired art of excluding unwanted stimuli. Mr. A. J. M. WRIGHT (Bristol) classified 71 cases from the point of view of ætiology;

those with an obvious cause, such as trauma and syphilis, offered no difficulty. He had seen dramatic improvement with salvarsan given early. Of the remainder two-thirds were females. In these doubtful cases septic foci accounted for a certain number; some were functional, and in these one could usually find a history of some suggestion early in the case. Of the remainder, childbirth, thyroid deficiency, and vaso-motor rhinitis accounted for the majority. He was satisfied that with regard to the deafness due to nerve traumatism by noise, removal of the cause led to an arrest of the progress of the lesion. Sir J. DUNDAS-GRANT, with a facility which can result only from a vast experience, touched rapidly upon a wide range of subjects, among them senile deafness (which, like other senile changes, was not a question of chronology), the explanation of the value of quinine in unilateral labyrinthine vertigo, the value of tuning-fork tests, the question of the effect of pre-existing ear disease in war cases, the use of perchloride of mercury in auditory nerve traumatism, deaf-mutism, and his instrument for the cold air caloric test. Mr. W. J. LEIGHTON (Manchester) said syphilis was not to be overlooked. He emphasised the psychological factor both in ætiology and treatment of deafness, described a labyrinthine storm relieved by inflation, and mentioned the importance of caloric tests in distinguishing between central and labyrinthine lesion.

The PRESIDENT said the speeches had brought out the important point that in a large proportion of internal ear deafness cases evidence of middle-ear disease was present. Many cases of so-called nerve deafness were possibly due to disease in the foramen rotundum. It was important, and perhaps significant, that all cases of hyperostosis of the meatus showed signs of deafness of the internal-ear type. He had not found during three years with an army "soaked with quinine" any chronic deafness caused by quinine or by malaria, and he had some doubt as to the existence of deafness due purely to such causes.

A concise and workmanlike paper was read by Mr. E. D. D. DAVIS (London) upon

Retrobulbar Neuritis of Nasal Origin.

He tabulated 54 carefully worked out cases, in four only of which he had been able to prove the existence of sinusitis. In these there was gross evidence of the trouble, and he deprecated any attack upon the sinuses in the absence of very definite signs of suppuration. The neuritis was wont to wax and wane with or without treatment, which made it difficult to accept accounts of cures. Sir STCLAIR THOMSON (London) agreed with Mr. Davis, and condemned a tendency in some countries to operate upon sinuses without evidence of disease, simply because improvement had followed such steps on occasion. Progress in surgery must be on surer foundations than this. Dr. RITCHIE RODGER (Hull) and Mr. SOMERVILLE HASTINGS (London), on the other hand, had seen dramatic improvement after opening sinuses apparently healthy, and ascribed a larger proportion of cases to sinus trouble.

The morning ended with an interesting paper by Mr. H. D. GILLIES (London) on the

Surgical Treatment of Nasal Deformity

with special reference to the nose of tertiary syphilis. His lantern slides bore convincing testimony to the advance he has made in this field, by the introduction of a two-stage operation. The first stage consists in the intranasal incision of the scar which anchors the remaining nose to the pyriform opening. This release enables the nose to be pulled down into a normal position, the resulting large raw area on its deep surface giving a measure of the loss of lining that has occurred. The replacement of this loss by Thiersch graft is achieved by his modification of the Esser inlay, and permits the second stage—of cartilage grafting—really to rid the patient of the "syphilitic" appearance. In a depressed fracture the cartilage graft may be inserted without the preliminary stage.

The afternoon was pleasantly spent in a visit to the Portsmouth Eye and Ear Hospital, where Mr. C. A. SCOTT RIDOUT showed a series of cases.

FRIDAY, JULY 27TH.

In opening a discussion on

Spasm of the Larynx,

Sir STCLAIR THOMSON, after a definition of terms, briefly reviewed the anatomy and physiology of the parts concerned and began by classifying the known causes of spasm. He emphasised throughout the importance of psychological factor in intensifying and even originating spasm, and mentioned that in his long experience he had not had occasion to perform tracheotomy, though he was far from condemning the procedure where the strain on the heart was obviously too great. He was convinced that whooping-cough in adults sometimes was the cause of spasm (an original observation this) and quoted cases due to gout, morphia-habit, and tabes. Like most of his hearers, he had found difficulty on occasion in distinguishing between abductor paresis and adductor spasm, but was able to indicate clinical methods of solving the difficulty. Having touched upon Semon's law and spasm in anæsthesia, laryngismus stridulus, hiccough, and epilepsy, he concluded by summing up the lines of treatment at our disposal. The problem, as ever, depends upon diagnosis, and in each case a most exhaustive examination was necessary to ensure that we were not treating a case of paresis by sedative methods.

Sir J. DUNDAS-GRANT drew a very definite distinction between laryngismus stridulus and laryngitis stridulosa, the latter condition being the same as croup and being found in rickety children. Perhaps the deficiency of calcium led to a relative hyper-excitability of the nervous system, and such irritations as adenoids supplied the necessary stimulus. He discussed the laryngeal crisis of tabes and their relief by local anæsthetisation of the larynx. He described laryngeal vertigo, and an explanation of it, and concluded by describing the relief of functional ephonia by faradising the lingual tonsil. Dr. W. J. KELSON (London) said that we must not neglect the fact that the ventricular bands form a false glottis which at times becomes spasmodically closed. He discussed the difficulty of distinguishing between spasm of the adductors and paresis of the abductors. He pointed out that the muscles which close the air-way happen to be stronger than those which open it, and, therefore, the tendency of any nerve irritation is to cause closure. The excitability of the reflex mechanism is greater in children, and especially in sleep, when the cortical centres are depressed. He quoted two cases of fatal spasm of the glottis in children in which a necropsy revealed the signs of rickets only. He described a case of hysterical and prolonged spasm in an adult woman accompanied by a high-pitched stridor both on inspiration and expiration, which was treated by galvanism. Dr. PETER MACDONALD had had unique opportunity of observing intimately a case of recurrent glottic spasm in a woman, and described the means regularly employed to bring an attack to an end. The PRESIDENT, unlike the opener, had had occasion to perform tracheotomy for glottic spasm upon a patient suffering from an aneurysm, and mentioned the danger of delaying intervention too long. Dr. WILLIAM HILL (London) described a dramatic case in which the patient had died as he made the incision for tracheotomy, and discussed the occasional need for artificial respiration after tracheotomy alone had been unsuccessful. Mr. A. J. WRIGHT and Mr. S. HASTINGS also described their experience of the condition.

Mr. LEIGHTON read an interesting paper on

Organotherapy in Ear, Nose, and Throat Work.

There were many conditions in which organotherapy formed a useful adjuvant to other treatment, but it was difficult to lay down rules. He might say, however, that the endocrine organs might act from excess or deficiency of secretion or from perverted secretion.

He mentioned McCarrison's work on the relation between sepsis in the tonsil and other organs and thyroid activity, and quoted cases bearing on it. The pituitary had become increasingly important, and headaches due to a derangement of the pituitary had to be diagnosed from sphenoidal disease. Diabetes, abnormal blood pressure, climacteric deafness, neuroses, hypothyroidism were all common causes of ear trouble and were alike amenable to organotherapy. Mr. Hastings inquired as to the dosage of thyroid extract advocated by the speaker.

Short Papers.

Mr. J. A. Gibb (Maidstone) read a short paper upon the Referred Pain of Nasal Sinus Disease. The position to which pain is referred was often disregarded. He would tell us of some cases in which a study of referred pain had been useful in his experience. Other viscera sometimes chose the same areas as did the nasal sinuses, and therefore, of course, one's observation should be backed by a thorough general overhaul. The position of the pain did not always depend on the severity of sinusitis, but might alter slightly if several sinuses were involved. He detailed the areas for the various sinuses and gave cases illustrative of his thesis. Mr. Wright, Mr. E. M. Woodman (Birmingham), and Mr. T. B. Jobson gave cases from their own experience.

In the afternoon Mr. V. E. Negus (London) read a paper upon a Newly-described Function of the Vocal Cords. The voices of animals did not necessarily depend on the size of their cords. During independent use of the fore-limbs for such actions as hanging from a branch or bringing them together against resistance the thoracic wall must be brought to rest to give a fixed origin to the muscles attaching the limbs to it. The pressure changes in the thorax are so great that sphincteric muscular action is inadequate to control them, and *valvular* action is brought into play in the larynx. He suggested that the cords closed and that the diaphragm descended a little, leading to a reduced pressure which played an important part in fixing the thorax. He used facts from comparative anatomy in support of his argument, but was inclined to infer too much from the observations made, and to underrate the many other causes which have operated in evolving the present structure of the larynx in man and other animals. His paper was discussed by the President, Sir StClair Thomson, Sir J. Dundas-Grant, Mr. Jobson, Mr. Wright, and Mr. Ridout.

Sir J. Dundas-Grant read a short paper upon Canfield's Operation upon the Maxillary Antrum, with cases. The method, described in 1908, consists essentially in a preturbinal approach to the sinus, the edge of the pyriform opening being removed subperiosteally until an inspection can be made of the interior. In the original operation, an elaborate flap of mucosa is prepared during the removal of the anterior third of the inferior turbinated bone, with which to line the antronasal communication, but the speaker agreed with Skillern and others in finding this unnecessary. The operation seems one to be reserved for those infrequent cases in which simple infra-turbinal drainage and lavage fail after some weeks to effect a cure. The President, Mr. Hastings, and Mr. Wright voiced the general attitude of the audience with regard to leaving plugging in the nose, and it was left to Dr. W. Hill, ever the champion of the under-dog, to side with the reader of the paper as to its occasional necessity.

Dr. W. Hill read a paper upon Butyn as a Local Anæsthetic in nose and throat work. He had found it capable of replacing cocaine in some cases though not in all. It was two and a half times as expensive and was found to be less reliable in some 60 cases. Sir J. Dundas-Grant, Dr. Sheehan, and the President also spoke.

After the last paper Dr. Eastman Sheehan (New York Post-Graduate Hospital) gave a novel demonstration of animated photographs of plastic operations for the relief of deformities of the nose.

DISEASES OF CHILDREN.

Thursday, July 26th.

This section met on two days. At the first session the President, Dr. Edmund Cautley (London), being in the chair, a discussion on

Acidosis and Alkalosis in Children

was opened by Dr. P. J. Cammidge (London), who said that the old idea of acidosis, in the sense that the symptoms associated with it were dependent upon the presence of unneutralised acid products of abnormal metabolism in the blood, had had to be replaced by a new conception. The normal faintly alkaline reaction of the blood was maintained constant by buffer substances which could deal with a large quantity of acids or alkalies without the reaction of the fluid being altered. The entrance of acid products into the circulation decomposed some of the bicarbonates and produced a relative excess of carbon dioxide which was then excreted by the lungs. Normally the bicarbonate was quickly replaced, but under pathological conditions the alkaline reserves might be depleted and the proportion of bicarbonate permanently diminished. Such symptoms as air-hunger would ensue, and finally death. Acidosis, then, was a condition in which the concentration of bicarbonate in the blood was reduced below the normal level. Theoretically acidosis might arise by introduction from without of a large quantity of mineral acid, by abnormal formation of acids within the organism (diabetic coma), defective elimination of excretory products (interstitial nephritis), or by excessive drain of bases as in profuse diarrhœa. Alkalosis would occur with excessive intake of alkaline bases. A similar condition might arise should there be an abnormally small amount of acid formed in the metabolic cycle, but of this there was no convincing example. An increase in the alkaline reserve occurred during gastric digestion when acid was excreted into the stomach. Finally it could be brought about by excessive elimination of CO_2 as in voluntary forced breathing. The speaker illustrated his points by reference to cases of diabetes and cyclic vomiting in children.

Dr. Ruth Conway Verney (Edinburgh) read a paper on the reaction of the blood in children. By observing the hydrogen-ion concentration in relation to the tension of free and of combined CO_2 it was possible to get some idea of the factors controlling the acid-base balance. Among these factors the blood-buffering power was of great importance. She wished to emphasise the value of protein base salts as buffers. Of these hæmoglobin compounds were the chief. She explained the way in which this buffering action of hæmoglobin was brought about. The results which she had obtained by blood estimations in normal children and in those with anæmia confirmed this. She had also studied the blood of children with post-operative acidosis. She hoped to build up a method by which a prognosis could be given as to the likelihood of acidosis occurring in a child about to undergo operation.

The President said that there was still a certain confusion in his mind as to the differentiation and effects of acidosis and alkalosis. Could ketonuria occur without acidæmia? If it could exist with alkalæmia, as some speakers had observed, it implied that imperfectly desaturated fatty acids were circulating in a blood in which there was an excess of alkaline bases.

Dr. E. P. Poulton (London) had listened with admiration to Dr. Cammidge's exposition of a difficult subject, but he did not agree with him on certain points. Although three years ago the speaker had himself suggested the classification used by Dr. Cammidge he now preferred to do away with the terms acidosis and alkalosis, and substitute "acidæmia" and "alkalæmia" for an increased or diminished hydrogen-ion concentration in the blood. He protested against the theory first put forward by Pavy, and revived by Dr. Cammidge, that coma was due to an inability of the blood to transport CO_2 from the tissues. Dr. Poulton spoke of the association of alkalæmia with tetany and described that form of tetany which is brought about by forced breathing. Possibly it was not the alkalæmia itself but some alteration in the balance of metallic ions which brought on the condition. He mentioned a case that had tetany from a gastro-colic fistula through which valuable HCl was passed in the stools. Cure followed the closing of the fistula. J. S. Haldane had shown that the ingestion of large doses of ammonium and calcium chloride caused an increase of fixed acid in the blood. This explained the success of these drugs in the treatment of tetany. In two cases of acute rickets at Guy's, Osman and Bayers had found a marked fall in the plasma bicarbonate. He considered, however, that diminished plasma bicarbonate was an accompaniment and not the cause of rickets.

Dr. **Eric Pritchard** (London) agreed that the view that acidosis and ketosis were the same obscured the real significance of acidosis. Health in children depended more on the extent of the alkaline reserve than on any other factor. The fæces were a very important source of elimination of metabolic products. Where the stools contained much fat, as in rickets, bases were excreted in combination with fatty acids and the alkaline reserve was thus rapidly depleted. The fatty acids in the fæces might be due to unabsorbed fat, or they might be produced in the blood, neutralised, and then excreted by the intestine. Defective oxidation was one of the causes of the appearance of fat in the fæces and of depletion of the alkaline reserve. It was usually due to overfeeding and to absence of fresh air and sunlight.

Dr. **Catherine Chisholm** (Manchester) said that in her experience acidosis occurred frequently in pneumonia, and the disease often responded quickly to large doses of alkalies.

Dr. **Cammidge** briefly replied.

Colonel **R. J. Blackham**, R.A.M.C. (retd.), read a paper on

Cows' Milk in Infant Feeding.

Unfortunately, he said, breast-feeding was not always possible and then cows' milk was the most practical substitute. The best form in which to give cow's milk was, however, a matter on which there was considerable difference of opinion. Raw milk was advocated by some, but it was dangerous on account of the bacteriological infection it could engender. The casein of one animal was, to an appreciable extent, toxic to the offspring of another animal. Heat caused an albumin to lose its individual characteristics and thereby diminished its toxic action. He endorsed Prof. Marfan's saying: "Cows' milk is better raw than cooked for calves and better cooked than raw for infants." He discussed the advantages claimed for condensed and dried milks. In his experience infants reared on the former were fat, pale, and often listless. Milk dried by the spray method had the advantage that it formed a curd like that of human milk. It was constant in composition, contained most of the vitamins, and was not liable to contamination.

FRIDAY, JULY 27TH.

Summer Diarrhœa.

Dr. **David Nabarro** (London) opened the discussion. He gave a review of the work done by bacteriologists, and of his own observations in the cases which he had studied with Dr. D. H. Paterson in 1921. In every epidemic the organisms found had been very variable. Even when the same bacillus was isolated from a group of cases, its characters were apt to change, and many subgroups were identified. Some bacteria, such as Morgan's No. 1 bacillus, were admittedly present in a large percentage of the cases, but they were also present in the fæces of normal children. It was impossible to assign any one of them as the cause of the disease. In America dysentery bacilli had been isolated in a number of cases which clinically showed blood and mucus in the stools. Similar cases had also been recorded in England, but in this country they formed a very small minority. He had therefore come to the conclusion that summer diarrhœa was not an infective disease in the strict sense of the word. The primary cause was not bacteriological but nutritional. He agreed with the dictum of Pfaundler that the children sicken "ex alimentatione," and that they died "ex infectione." Exposure to heat or cold, bad air, over-clothing, and improper feeding paved the way for bacterial infection. At the same time there was probably an increased virulence of the organisms concerned. The incidence of summer diarrhœa had decreased considerably of late years, and he hoped that the disease might soon become a thing of the past. The work of welfare centres in teaching mothers how to clothe and feed their children, the reduction of flies in cities, and the use of dried milk were all contributing towards this end.

The **President** said that Dr. Nabarro had raised many interesting points. He himself thought that summer diarrhœa was infective. In his hospital, although the cases were nursed like typhoid, the disease sometimes spread in a ward from one child to another. The infection in these instances was probably carried by flies. Some of the most severe toxæmic cases he had seen had begun in well-nourished children. In them a predisposing state of nutrition did not appear to have had anything to do with it. He considered that the disease was infective, but that many different organisms were involved.

Dr. **D. H. Paterson** (London) pointed out that true summer diarrhœa occurred in only a small proportion of children who had diarrhœa in summer. The Americans distinguished between fermentative and infective diarrhœa according as to whether the stools contained blood and mucus or not. In his series at Great Ormond-street, out of 149 only four had shown blood and mucus. Fifty per cent. had a history of dyspepsia, the other half were fat and over-fed. In such children a spell of hot weather might bring on an acute intestinal upset. If they were taken off food altogether, acidosis was likely to supervene. Most of the cases of diarrhœa were due to bad feeding and mismanagement. Only a small minority were the result of a specific organism. In proof of this he maintained that a diet in which fermentation was reduced to a minimum was the most successful in treatment.

Dr. **Bernard Myers** (London) followed Finkelstein's classification of nutritional disorders. Excess of sugar and fat was a common cause of intestinal fermentation. Treatment in these cases consisted in reducing the sugar and the fat in the food. Protein was well tolerated. Some cases were nutritional, some infective; the treatment of the two conditions was different.

Dr. **Chisholm** supported the infective theory. The decline of the disease was due to welfare work and to the care taken in cities to prevent the spread of infection.

Dr. **E. P. Baumann** (Johannesburg) said that we had hitherto made a mistake in considering that all cases were infective. Some had a nutritional basis. We must not, however, go to the other extreme. The mode of onset would differentiate between the two types. Finkelstein fed his cases on buttermilk or whey; he seldom starved, never for more than six hours. Buttermilk had the advantage of being a food rich in water and salts.

Dr. **G. B. Sweet** (New Zealand) said that he believed in Dr. Finkelstein's treatment, but protein milk was difficult to prescribe in general practice. He had obtained considerable success in treatment of cases with dried skim-milk. It was simple to use, free from germs, and contained very little fat. It was the fat in the food which was the chief source of trouble.

Dr. **Pritchard** laid stress on the reaction of the fæces as a guide to treatment. In fermentative diarrhœa the stools were acid, when there was proteolytic decomposition they were alkaline. Buttermilk was merely a coarse method of introducing the lactic acid bacillus. He preferred to give lactose with lactic acid bacilli when the stools were alkaline, and protein milk when there was acid fermentation. Indiscriminate treatment with protein or sugar solution was equally unsatisfactory. Instead of buttermilk he used a solution of pure casein. Saline was preferable to whey when salts were required. He agreed with the majority of speakers that cases might be nutritional or infective. Children who had been fed on carbohydrates suffered most in an epidemic.

Dr. **Nabarro** and Dr. **Paterson** replied to the discussion.

Dr. **Hugh Ashby** read a paper on the

After-Results of Abdominal Tuberculosis in Children.

He laid stress on the difficulty of arriving at a certain diagnosis. It was important to exclude cases of rickets or dyspepsia which might closely resemble tuberculosis. Resistance to tuberculosis in early life was at its minimum. Cases under 1 year were practically always fatal, but the prognosis improved with the age of the child. The disease was most common at the age of 3 years. The source of infection had been a matter of considerable dispute. It had been stated that in 50 per cent. the disease was bovine, but in his opinion the majority of cases were due to human infection. With regard to the after-results in a series of 250 cases which he had been able to follow up, 56 per cent. were cured, 8 per cent. were doubtful, and 36 per cent. had died. These statistics showed the seriousness of the disease in children. In the cases which had recovered the large majority had grown up and kept perfectly well, a few had a tendency to colic and to looseness of the bowels. In some a mass of calcified glands could be felt in the same situation as the former enlarged glands, but they caused no trouble.

Dr. **E. A. Cockayne** (London) commented on the absence of after-effects. He also had felt calcified nodules which produced no symptoms.

Dr. **Pritchard** did not agree that abdominal tuberculosis under 1 year of age was invariably fatal. During the last ten years he had treated a number of children who had been infected by tuberculous mothers. Early diagnosis was made by means of tuberculin injections. In his series there had only been one death. Treatment by tuberculin had been very successful.

Dr. **Sweet** had obtained very good results in his cases by tuberculin treatment.

Dr. **E. S. Molyneux** (Leamington) read a paper on the treatment of tuberculous cervical adenitis by radium. The treatment was painless and safe provided the technique was carefully carried out, and he had obtained a cure in nearly every case. Recurrence was rare. Caseating masses of glands, suppuration, and the presence of old sinuses were no bar to treatment. No scar was left unless suppuration had already occurred.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

(Concluded from p. 306.)

Food Preparations.

Foodstuffs and food accessories were represented by a large number of separate exhibits. [4] Bantam Products Ltd. (Farnley, Leeds): showed a preparation consisting of the soluble portion only of the coffee beans, the woody fibre having been removed; by this means a cup of fresh coffee of any desired strength can be instantly prepared with hot water alone, a 1s. 6d. tin providing 36 ordinary cupsfull.—[10] Food Products Ltd. (11, Queen Victoria-street, London, E.C. 4): a series of bovo-lactin foods, devised and elaborated by the late Dr. E. C. Hort, consisting of calculated amounts of animal protein, hæmoglobin, milk solids, and carbohydrates. Bovo-lactin essence contains, per cent., protein 30·4, fat 0·2, ash 18·8, moisture 23·3, carbohydrates and extractives 27·4.—[46] Bovril Ltd. (148, Old-street, London, E.C. 1): meat extract containing fibrin and albumin in concentrated form, with a special invalid preparation more highly concentrated and devoid of seasoning. Attention was directed to the giving of half a pint of bovril before administration of an anæsthetic for the avoidance of post-operative sickness.—[49] Cadbury Bros., Ltd. (Bournville, Birmingham): an exhibit of Bournville cocoa and Bournville chocolate conforming to the highest standards of purity and uniformity.—[27] Food Education Society (329, Vauxhall Bridge-road, London, S.W. 1): a selection of literature, non-dogmatic and philanthropic, to educate the public in matters of food, cookery, and health; leaflets on diet for brain workers, aids to fitness, the importance of fat, how to choose sugar and others.—[53] Wm. Gaymer and Son, Ltd. (Attleborough, Norfolk): various brands of Gaymer's cyder, including the quality known as "dry," prepared from Norfolk apples.—[75] Glaxo (J. Nathan and Co., Ltd., 56, Osnaburgh-street, London, N.W. 1): full-cream, three-quarter-cream, and half-cream standardised dry milks for infants and adults, the milk being dried by a process proved to be non-destructive of the accessory food factors; attention was called to the timely use of glaxo in hot weather as a prophylactic against epidemic gastro-enteritis.—[50] Mead, Johnson and Co. (40, Lexington-street, London, N.W. 1): dextrines and maltose combined with cows' milk and water to form a complete diet for infants. No feeding directions accompany the packages, the doctor being left free to regulate the diet according to individual need.—[59] Horlick's Malted Milk Co. (Slough): an easily digested and highly nutritious diet for invalids and convalescents and a complete food for infants, filling a special need in Red Cross work, for preparation requires no cooking, the powder being simply briskly stirred into hot or cold water. Tablets are also available.—[76] Oxo Limited (Thames House, London, E.C. 4): Oxo fluid beef, being a concentrated form of stimulating extractives; Hospital-Oxo for invalids, peptonised and unseasoned; Lemco pure unseasoned beef extract; and the well-known Fray Bentos food products.—[16] Prideaux's Pure Casein Co., Ltd. (16, Southwark-street, London): the Dorsella milk food for babies and nursing mothers, a full-cream dried milk powder, prepared under approved conditions in Dorset. One pound cartons are supplied in bulk to welfare centres at 1s. 6d. in winter, 1s. 3d. in summer; also "casumen" pure milk casein containing 93 per cent. protein, and whey and buttermilk powders.—[84] Stowers (58, Bancroft-road, London, E. 1): cordials prepared from Jamaican and Dominican cultivated limes and from pure lemon juice with addition of cane sugar only, attention being called to the presence of vitamin A and the value of such preparations as antiscorbutics.—[22] Thew, Hooker and Gilbey, Ltd. (Buckingham): various milk products, including Hooker's malted milk and Hooker's malted milk tablets.—[37] Trufood Ltd. (Lever House, Blackfriars, London, E.C. 4): full-cream dried milk, prepared at the Creameries, Wrenbury, Cheshire, and readily reconstituted in cold water; also Humanised Trufood, with part of the casein withdrawn and cream and lactose added; also Secway, a sweet whey in powder form.—[73] Virol Limited (148, Old-street, London, E.C. 1): a preparation rich in marrow and beef fats, containing malt extract, eggs, and lemon syrup, for use in cases of wasting, rickets, and malnutrition; virolised milk is held to promote sound and natural sleep. Also virolax, containing 60 per cent. liquid paraffin in finely divided form acceptable to children and adults.—[39] Vitmar, Ltd. (Callard's Vitamin Foods, 74, Regent-street, London, W. 1): a food adjunct of high caloric value and containing vitamins A, B, and C, recommended for infants and growing children as well as a galactogogue for nursing mothers.

Medicinal and Mineral Waters.

[15] The Apollinaris Co., Ltd. (4, Stratford-place, London, W. 1): Apollinaris, the pure natural sparkling mineral water bottled with it own CO$_2$ gas; Apenta, a natural aperient water for cases of habitual constipation and biliousness; Vittel, a diuretic mineral water for the arthritic and gouty.—[80] Bath (Mr. John Hatton, Director of Baths): an exhibit sent by the corporation, consisting of photographs of the bathing establishments and the chief features of interest at this inland spa.—[71] Buxton (Mr. H. L. B. Pitt, General Manager): an exhibit of official handbooks and of the waters for sale in bottle form from this mountain spa, 1000 feet above sea-level.—[79] Droitwich (Mr. J. H. Hollyer, Director of Bathing Establishments): setting out the characteristics of the climate in summer and winter of England's brine-baths spa, the character of the waters, and of the attractions offered.—[72] Harrogate (Mr. F. J. C. Broome, General Manager): unique in its diversity of springs, with 87 waters of various characteristics collected under chemical and physical control.—[70] Ingram and Royle, Ltd. (45, Belvedere-road, London, S.E. 1): samples of imported natural mineral waters, salts, and pastilles, including Vichy-Célestins, Contrexéville-Pavillon, Evian-Cachat, Hunyadi-János, and 20 others.

Microscopes and Scientific Apparatus.

[1] J. W. Atha and Co. (8, Southampton-row, London, W.C. 1): showed Zeiss microscopes, with accessories including the photographic ocular "Phoku" with continuous vision, and an apochromatic objective "X" for dark-ground work. [7] C. Baker (244, High Holborn, London, W.C. 1): various types of microscope from the R.M.S. designed for the highest research work and photomicrography down to the *Advanced Student's Microscope*; also Greenough's binocular and universal models.—[8] Chas. Hearson and Co., Ltd. (14, Princes-street, London, W. 1): a large selection of bacteriological, pathological, physiological, botanical, and chemical apparatus, including Dreyer's new fat-extraction bath for tubercle antigens.—[35] Kodak, Limited (Kingsway, London, W.C. 2): some interesting results of the Eastman panchromatic film which differentiates between yellows and reds and admits of any degree of contrast when used in conjunction with a Wratten filter; also developing tank outfits and dark-room accessories for X ray work.—[61] Rayner and Keeler, Ltd. (Kemp Town, Brighton): a variety of lenses and ophthalmological instruments including the Edridge-Green lamp and card tests, and various new types of lens, such as the lenticular deep concave.—[30] Short and Mason, Ltd. (Aneroid Works, Walthamstow, London, E. 17): the Tycos sphygmomanometer, accurate and portable, a practical instrument for determination of the diastolic, systolic, and pulse pressures.—[25] The Tintometer, Limited (the Colour Laboratories, Salisbury): Lovibond's colour scale and tintometer for the measurement and registration of the colours of gases, liquids, and solids; also Dr. Corbet's radiometer for the accurate measurement of colour changes in Sabouraud pastilles.

Sundries.

[57] The Cellular Clothing Co., Ltd. (72, Fore-street, London, E.C.): showed Aertex cellular clothing for health and comfort, and a selection of red garments cutting off actinic rays for use in the tropics.—[60] Hoskins and Sewell, Ltd. (Bordesley, Birmingham): special beds and bedstead equipment for hospitals, sanatoria, and open air treatment, including the patent wheeling spinal stand, the "silent night" hospital mattress, and the Alton sunshade.—[51] Ronuk, Ltd. (Portslade, Sussex): materials and appliances employed in the preparation, initial polishing, and maintenance of flooring and other interior woodwork.

Medical Agencies.

[32] Mr. W. S. Atkins (43, Bedford-street, London, W.C. 2): agent for medical tranfers and for permanent non-cancellable sickness and accident policies specially devised for the medical profession.—[64] The Medical Insurance Agency (429, Strand, London, W.C. 2): founded in 1907 to advise medical practitioners as to contracts most suitable to their needs and to obtain for them policies on the most advantageous terms consistent with secure protection.—[21] The Medical Sickness, Annuity and Life Assurance Society, Limited (300, High Holborn, London, W.C.): founded in 1884, as a mutual society confined to members of the medical and dental professions, for insurance against sickness and accident on a permanent contract basis.

Books and Office Accessories.

[18] W. H. Barrell, Ltd. (112, High-street, Portsmouth): showed a comprehensive exhibit of portophones, typewriters, loose-leaf ledgers, dictographs, and the kardex visible record system, specially recommended for clinical reference.—[77] H. R. Ellis (9, Lovell's-court, London, E.C. 4): medical, surgical, veterinary, and dental books, very complete on the side of psychology and allied subjects.—[31] The Hammond Typewriter Company, Ltd. (75, Queen Victoria-street, London, E.C. 4): the multiplex machine, capable of writing in every language or style of type and in which the turning of a knob suffices for emphasis or special announcement with italic or other type. The machine is fitted with special medical and chemical characters and miniature type for writing out small labels.—[26] H. K. Lewis and Co., Ltd. (136, Gower-street, London, W.C. 1): a classified exhibit of new books in many departments, including those of the Cambridge University Press, and a selection of medical stationery, case-books, loose-leaf ledgers, card-index systems, and rubber-stamp diagrams.—[5] Minty (36, Southampton-street, London, W.C. 2): the Oxford Varsity sectional bookcases without metal fittings or projections and both dust- and damp-proof.—[54] Oxford Medical Publications (1, Bedford-street, London, W.C. 2): a complete set of text-books and works in medical, surgical, and general science.—[24] Stanley Phillips (45, Brondesbury-road, London, N.W. 6): an eclectic selection of recent publications in every branch of medicine, surgery, and allied sciences, including year-books of general medicine, surgery, and special subjects, and Meyer's Medical Dictionary in eight languages.—[62] L. L. Waters and Co. (55, Commercial-road, Portsmouth): office furniture of British manufacture made by Messrs. Frank Corke and Co., Southsea, also the Doctor's National Insurance Panel Card Index Cabinet.—[74] John Wright and Sons, Ltd. (Bristol): an excellent selection of recent publications, including indexes of differential diagnosis, prognosis, and treatment; the Medical Annual, a year-book of treatment and practitioner's index; and the medical practitioner's card-index system for account keeping.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj. D. L. Harding to be Lt.-Col., vice Lt.-Col. C. W. Mainprise (promoted).

The undermentioned Majs. retire, receiving a gratuity: C. Clarke (granted the rank of Lt.-Col.), G. Petit, and C. Ryles.

Temp. Capt. J. J. Walsh relinquishes his commn. and retains the rank of Capt.

The undermentioned Lts. are confirmed in their rank: F. C. H. Sergeant, W. L. S. Cox, and H. A. Gilkes.

TERRITORIAL ARMY.

The undermentioned relinquish their commns. and retain their rank, except where otherwise stated: Majs. E. C. M. Foster and J. Ewing; Capts. A. R. Beam and H. Buck (granted the rank of Maj.), J. B. Macalpine, G. Stuart, and S. R. Wilson.

Capt. R. G. Michelmore (late R.A.M.C.) to be Capt.

ROYAL AIR FORCE.

G. Clark is granted a short service commission as a Flying Officer.

Correspondence.

"Audi alteram partem."

X RAYS IN EXOPHTHALMIC GOITRE.

To the Editor of THE LANCET.

SIR,—The leading article in to-day's issue of THE LANCET (p. 287), in commenting upon the two very excellent papers of Prof. G. R. Murray and Mr. A. J. Walton on the treatment of exophthalmic goitre, draws attention to the differences of opinion expressed therein as to the value of X ray applications. Mr. Walton has found their use "very unsatisfactory," and were the experience he records to be accepted as an average one I think all would agree with him. Surely, however, there must have been some flaw in the technique in the cases he has met with, where the effect of the rays appears to have been limited to scarring and burning of the skin, and in one case to actually producing a squamous carcinoma, without any changes in the gland or the periglandular tissues sufficient to be appreciated at a subsequent operation. My purpose in writing is not to advocate the X ray treatment of exophthalmic goitre, but that X rays, as applied by Dr. A. E. Barclay and Dr. J. M. W. Morison of this city, by the method described in Prof. Murray's paper, can be made to produce a very definite effect upon the gland without detrimental effect upon the skin I have no doubt whatever. The results in 100 cases [1] are to me, at any rate, fairly convincing, and in the same paper reference is made to a case of Mr. H. Stratford, shown at the West London Medico-Chirurgical Society, [2] in which radiation of the scar and the supraclavicular region for a year after removal of the breast for carcinoma induced such extensive atrophy in a previously healthy thyroid gland that the patient developed myxœdema.

My experience differs from that of Mr. Walton, who has "never found that it—i.e. X rays—makes a future operation more difficult on account of the fibrosis." I have operated upon several cases for Prof. Murray where X ray treatment had been previously applied, and have generally found that periglandular fibrosis is present, sometimes in so marked a degree as to render the freeing of the gland a much more difficult and lengthy procedure than usual. The fibrosis seems, moreover, to extend to the walls of the small arteries, so that the mouths of small vessels which would otherwise have closed automatically when torn across in separating the gland are unable to do so and bleed persistently, necessitating the application of many more ligatures than usual. By prolonging the operation and increasing the amount of handling of the gland and wound I believe that the prolonged use of X rays does increase the severity of a subsequent operation. Unless, therefore, X rays produce material benefit fairly quickly, their application should not be persisted with.—I am, Sir, yours faithfully,

Manchester, August 11th, 1923. ARTHUR H. BURGESS.

A NATIONAL PATHOLOGICAL MUSEUM.

To the Editor of THE LANCET.

SIR,—The cancer problem is now being tackled seriously by the medical profession, and appeal is being made to the general public for funds. May I earnestly urge that the histological side should be more widely and extensively studied? The histological structure of tumours varies so much that it is a matter of the greatest difficulty to follow them and keep them in mind. The great majority of specimens of malignant growths can be recognised quite easily, but there are an appreciable number which the pathologist finds the utmost difficulty in "spotting." Very early malignant growths and malignant changes occurring in a primary innocent tumour cause the greatest difficulty. In my own practice I meet with quite a large number of these cases, so what must be the total number throughout the country? These specimens would form valuable material for the investigation of cancer in its earliest stages and for the training of pathologists. I wish therefore again [1] to urge "the establishment of a national pathological museum, to contain examples of every disease of which examples can be obtained, especially microscopic sections of the different tissues." These specimens should be fully described and accompanied by clinical histories, so that pathologists might turn to them for guidance. At present a pathologist is often unable to give precise information as to what course a case showing an unusual type of tumour is likely to take; sometimes he can get this information from a brother pathologist, generally not. At present pathologists often hold different views as to the nature of certain tumours and their probable course, whether malignant or innocent. Definite information on these points would be obtainable in the records attached to the specimens in a national museum.

If the appeal for funds results in a satisfactory response, I hope the committee already formed will consider the allocation of a sufficient sum to, say, the Royal College of Surgeons, to inaugurate such a museum.—I am, Sir, yours faithfully,

ERNEST H. SHAW, M.R.C.P.

Camden-road, N., August 13th, 1923.

SAILORS AND VENEREAL DISEASES.

To the Editor of THE LANCET.

SIR,—With reference to the annotation on the above subject in your last issue, the National Council for Combating Venereal Diseases wishes to express its very grateful thanks to Sir John Collie for all the trouble he took in getting this Bill, drafted and promoted by it, through the House of Commons. The same Bill in the last Parliament became an agreed measure and only failed of becoming law owing to the sudden dissolution. Sir John Collie was kind enough to undertake to father it at its re-introduction in the present Parliament, and as an agreed measure it passed the House of Commons. The thanks of the Council are also due to Lord Muir Mackenzie who, at the request of Sir John Collie, undertook to shepherd it through the House of Lords. The National Council has been working to obtain this legislation since 1919.

I am, Sir, yours faithfully,

102, Dean-street, W., August 13th, 1923. E. O. GRANT, Secretary.

VILLAGE SETTLEMENTS FOR EX-SERVICE MEN.

To the Editor of THE LANCET.

SIR,—It is to be hoped that Lord Haig's appeal will not pass unheeded. It is because the majority of English men and women do not understand the position of the ex-Service man and are unable to grasp the truth that this apparent apathy exists. May I take the example of the ex-soldier consumptive, whether he be officer or private? What can be more awful than his present position—unemployed and unemployable in the ordinary workaday world? Yet in a village settlement such as Papworth he may not only find health but suitable employment at full wage or salary for the remainder of his days. At the moment the ex-officer has no opportunity of benefiting from such a scheme, being debarred by the regulations of the Ministry of Pensions. Health, employment, hope—all these he could obtain under the village settlement scheme. These men—both officers and men—desire the opportunity to work, to lead a life of usefulness without detriment to their health, but so far this country has given them very little help or encouragement. Capital only is required; the men cease to be a burden to the State once they are settled in the village settlement.

I am, Sir, yours faithfully,

Cambridge, August 7th, 1923. P. C. VARRIER-JONES.

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[1] G. R. Murray, Brit. Med. Jour., 1922, i., 907.

[2] THE LANCET, 1921, ii., 1059.

[1] *THE LANCET, 1923, i., 218*

UNIVERSITY ELECTIONS IN THE NEW DAIL (IRISH FREE STATE).

To the Editor of THE LANCET.

SIR,—A meeting of graduates of the National University, Ireland, adopted as candidates for the representation of the University in the new Dail Mr. Michael Hayes, M.A., Mr. John MacNeill, D.Litt., and Mr. William Magennis, M.A. A committee to secure the election of these candidates was appointed, and in the course of an appeal on behalf of the candidates has stated: Under present conditions stability of government and public security are the supreme necessity. Neither education, public health, nor any other vital service of the nation can be promoted unless stable government and respect for law are assured. Much constructive work awaits the coming Dail. Educational reform, long overdue, must be no longer delayed; no departments more urgently demand improvement than university and secondary education. Hand in hand with educational reform must come a real effort to provide efficient health services for the nation. The committee concludes by stating it confidently expects the vote and support of the electors for the three candidates selected, who share the views expressed in the appeal on their behalf by the Committee of Graduates.

The three candidates selected were the representatives of the National University in the last Dail. Although none of the candidates selected is a member of the medical profession, nevertheless it must be said all of them showed a very keen interest in medical matters in the last Dail, and were always ready to assist the medical profession whenever there was an occasion to approach the Minister of Local Government, who had charge of medical affairs. In the latter respect Mr. Hayes was frequently the means of bringing the profession in the Free State in contact with the Minister of Local Government. It was Mr. Hayes who arranged for and introduced to the Minister of Local Government the deputation from the Irish Medical Committee who waited recently in connexion with the proposed scheme of medical legislation for the Irish Free State. Mr. Magennis also did very excellent work in the last Dail for the profession. He made, on different occasions, eloquent and powerful speeches urging the better treatment of Poor-law medical officers both as regards salaries and pensions, and put himself on every occasion at the disposal of the profession when it was a case of redressing their legitimate grievances. It is hoped that medical graduates of the National University resident in Great Britain and Ireland will not fail to record promptly their votes for the candidates whom they have reason to believe will best serve medical interests and the interests of public health generally in the new Dail.

At the time of writing Dublin University has not selected its representatives for the Dail. It is, however, almost certain that Sir James Craig, M.D., will be a candidate if there is to be a contest, and it is hoped the electors of the Dublin University will record for him their first votes. Sir James Craig was a most successful and popular member of the last Dail; he did excellent work in enlightening members of that body with regard to all matters of a medical nature, and whenever, in this respect, he made representations to the Government he generally succeeded in getting most of what he wanted.

I am, Sir, yours faithfully,

T. HENNESSY, F.R.C.S.I.,
Irish Medical Secretary, B.M.A.

South Frederick-street, Dublin, August 13th, 1923.

PS.—University electors should lose no time in returning their ballot papers when signed and with them the identification certificate; either without the other is useless. The poll will be open for one day only—Monday, August 27th—and as the postal service is still somewhat disorganised, the proper course is to have the necessary papers signed and returned without an hour's delay.

THE IMPERIAL CANCER RESEARCH CAMPAIGN AND THE CANCER PROBLEM.

To the Editor of THE LANCET.

SIR,—Major Leonard Molloy's letter in your issue of August 11th requires correction in one or two essentials. The British Empire Cancer Campaign is distinct from the Imperial Cancer Research Fund; the latter has been in existence for 20 years. The British Empire Cancer Campaign is not yet in existence as an organisation engaged in cancer research. Dr. Molloy says that the Treasury grant to the Imperial Cancer Research Fund is "utterly inadequate." This is an erroneous statement of the case, because the Imperial Cancer Research Fund is not now and never has been in receipt of Government financial support, although several Government departments are represented on its general committees and subcommittees. Permit me to add that I disagree with the implication in Dr. Molloy's letter that the only requirement for success in cancer research is money. It is a libel on men of science in this country to suggest that the trained intellects capable of solving the pathological and therapeutic problems of cancer are here and only waiting for the money to tempt them to engage in these problems.—I am, Sir, yours faithfully,

J. A. MURRAY.

Imperial Cancer Research Fund, 8–11, Queen-square, W.C. 1, August 13th, 1923.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Final Examination of the Conjoint Board held during the month of July the following candidates were approved in the subjects indicated, but are not eligible for diplomas:—

Medicine.—B. Abelman, Liverpool; R. S. Anderson, St. Bart.'s; R. G. Anthony, Birmingham; A. J. Boase, St. Thomas's; E. G. Bradbeer, Bristol; A. Broido, Guy's; J. W. Brown, Middlesex; S. G. Brown, London; Mary Buck, Royal Free; F. B. Byrom, London; H. K. Christie, Otago; W. Clark, Charing Cross; R. F. Connell, Middlesex; R. Cove-Smith, Cambridge and King's Coll.; A. B. Cowley, St. Bart.'s; I. S. Cristol, Leeds; G. J. W. Crosby, Cambridge and Univ. Coll.; S. S. Cruden, St. Bart.'s; D. E. Cuffey, Cambridge and King's Coll.; Agnes S. Daniel, St. Mary's; A. B. Davies, Guy's; D. T. Davies, Cardiff; Margaret B. M. Dewhurst, St. Mary's; V. W. Dix, Cambridge and London; I. A. Dubinsky, Halle; H. R. Dutton, Bristol; Winifred P. Edmunds, King's Coll.; Barbara J. Edwards, Birmingham; L. C. Edwards, Cardiff and London; A. C. M. Elman, Univ. Coll.; R. B. Fawkes, Cambridge and Guy's; E. K. A. Firth, Edinburgh and St. Thomas's; H. B. Flooks, Guy's; Theodora M. Fowler, St. Mary's; H. G. Goldwater, Middlesex; H. Graf, Liverpool; F. H. K. Green, St. Bart.'s; R. D. Gross, Guy's; S. A. Gunter, St. Bart.'s; I. E. Harries and J. C. Hewetson, Guy's; G. Hochschild, St. Thomas's; Frances A. Hogben, Manchester; E. G. Holmes, Cambridge and St. Bart.'s; Dorothy M. Howse, Univ. Coll.; Gwynedd Hugh-Jones, Royal Free; L. I. Hyder, King's Coll; E. C. James, Cardiff; S. W. M. King, St. Bart.'s; P. E. M. Lanier, Middlesex; J. J. Lewenstein, Guy's; L. A. N. Line, Birmingham; R. H. Little and R. G. B. Marsh, St. Thomas's; D. G. Martin, St. Bart.'s; Lucy M. T. Masterman, St. Mary's; G. B. Matthews, Charing Cross; T. F. Merrick and H. D. N. Miller, King's Coll.; G. O. Mitchell, Guy's; G. F. L. Mitcheson, Oxford and St. Thomas's; P. M. Moffatt, Guy's; C. L. N. Morgan and N. Moulson, St. Bart.'s; G. Murray-Shirreff, Bristol; M. Myers, Durham and Guy's; Grace H. Newell, Royal Free; F. N. Newell-Roberts, Guy's; C. E. Newman, Cambridge and King's Coll.; Doris M. Odlum, St. Mary's; F. W. Oldershaw, London; Helen E. D. E. Ornstein, King's Coll.; C. H. Owen, Liverpool; T. G. W. Parry, Guy's; P. R. Peacock, Middlesex; T. W. Preston, H. A. Robertson, and O. F. W. Robinson, King's Coll.; Sybil H. G. Robinson, London; A. B. Rufail, King's Coll.; G. Sanders, Liverpool; A. S. Simpson, King's Coll.; K. H. Southall, Univ. Coll.; T. R. Sutherland, Cambridge and St. Bart.'s; Margaret Swete and Annie Sydenham, Royal Free; W. E. C. Thomas, Cardiff; R. W. H. Tincker, St. Bart.'s; F. C. O. Valentine, Cambridge and London; Kathleen C. Vost, St. Mary's; G. M. Wadsworth, Leeds; H. F. Walker, Middlesex; and Esther Wingate and Isabelle J. Woodhouse, Royal Free.

Surgery.—R. D. Alexander, St. Thomas's; R. H. Amm, Guy's; N. F. Azer, Charing Cross; A. E. Beith, St. Bart.'s; E. M. Bergheim and M. Bersinski, Middlesex; D. R. Blunn, London; C. O. S. B. Brooke, St. Bart.'s; R. W. Brookfield, Liverpool; Lily C. Butler, Royal Free; F. B. Byrom, London; Phyllis M. S. Chalmers, Royal Free; P. S. Connan, King's Coll.; I. S. Cristol, Leeds; E. R.

Appointments.

DICKSON, C., M.D. Belf., D.P.H., has been appointed Chief Medical Officer of the Irish Free State Post Office.

EDWARDS, T. P., M.D., B.S. Lond., D.P.H. Camb., Medical Officer of Health to Wrexham Urban and Rural District Councils.

GALLOWAY, D. J., M.D. Edin., to be a Member of the Executive Council of the Straits Settlements.

NEIL, W. F., F.R.C.S. Eng., one of the Medical Referees under the Workmen's Compensation Act, for County Court Circuit No. 18.

SOUTHAM, A. H., M.D., M.Ch. Oxf., F.R.C.S. Eng., one of the Honorary Surgeons to the Manchester Victoria Memorial Jewish Hospital.

Vacancies.

For further information refer to the advertisement columns.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each £100.

Birmingham, Children's Hospital.—H.P. and H.S. Each £100. Also R.M.O. £150.

Birmingham, Queen's Hospital.—Third P. for Out-patients. £50.

Blackburn County Borough.—Female Asst. M.O.H. £736.

Bristol Royal Infirmary.—Sen. Res. M.O. £300. Also H.P.'s, H.S.'s, each £120, and Dent. H.S., £156.

Burnley, Victoria Hospital.—H.S. £200.

Cape Town, Somerset Hospital.—Res. Med. Supt. £750.

Carlisle, Cumberland Infirmary.—Res. M.O. £175.

Chester Royal Infirmary.—Hon. Asst. Anæsthetist.

City of London Hospital for Diseases of Heart and Lungs, Victoria-park, E.—Half-time M.O. £200.

Colombo Municipality, Ceylon.—Third Asst. M.O.H. Rs. 9000.

Dumfries, Crichton Royal Mental Hospital.—Asst. P. £350.

East African Medical Service.—M.O. £600.

Hull Tuberculosis Sanatorium, Cottingham.—Res. Tub. O. £350.

Ipswich County Borough.—Asst. M.O.H., &c. £500.

Kent County Council.—Tuberculosis O. £696 4*s.* 8*d.*

Leamington Spa, Warneford, Leamington, &c., General Hospital.—Res. H.P. £150.

Leicester Royal Infirmary.—Locum Tenens Anæsthetist.

London Temperance Hospital, Hampstead-road, N.W.—H.P. £120.

Manchester, St. Mary's Hospitals for Women and Children.—Two H.S.'s. Each £50.

Manor House Hospital, Golders Green, N.W.—Jun. H.S. £150.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. Cas. O. £200.

Reading, Royal Berkshire Hospital.—Hon. Asst. P. Hon. Asst. Anæsthetist. Also H.S. £150.

Royal Naval Medical Service.—Surgeon-Lieutenants.

St. Bartholomew's Medical College, E.C.—Demonstrator of Physiology.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.

South London Hospital for Women, South Side, Clapham Common, S.W.—First H.S. £100. Second H.S. £50. Also H.P. £100.

Staffordshire Education Committee.—Two Asst. School Med. Inspectors. £600.

Warrington Infirmary and Dispensary.—Jun. H.S. £200.

Warrington, Lancashire County Mental Hospital, Winwick.—Deputy Med. Supt. £350.

Warwickshire, King Edward VII. Memorial Sanatorium, Hertford Hill, near Warwick.—Asst. Res. M.O. £350.

West African Medical Service.—M.O. £660.

West London Hospital, Hammersmith-road, W.—H.P.; also two H.S.'s. £100.

West Riding County Council.—School Med. Inspector. £500.

York City Mental Hospital, Fulford.—Locum Tenens. £7 7*s.* weekly.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Lydney (Gloucester).

Births, Marriages, and Deaths.

BIRTHS.

HAWARD.—On August 11th, at The Wold, Woldingham, Surrey, the wife of Walter Haward, M.B., B.S., of a daughter.

SAUNDERS.—On August 10th, at Lyford-road, Wandsworth Common, the wife of Dr. R. J. Saunders of a daughter.

MARRIAGES.

BOOBBYER—SHAW.—On August 7th, at Christ Church, Oxford, Philip Watson Boobbyer, B.A., M.B., B.Ch. Oxon., M.R.C.S., L.R.C.P., to Vera Elisabeth Shaw, M.R.C.S., L.R.C.P., second daughter of Bishop and Mrs. Shaw, of Christ Church, Oxford.

DEATHS.

ACKLAND.—On August 6th, at St. James'-court, S.W., Robert Craig Ackland, C.B.E., M.R.C.S., L.R.C.P., L.D.S., aged 58.

STENHOUSE.—On August 10th, at St. Andrews-place, Lewes, John Robert Stenhouse, M.D. Lond., aged 52 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HYGIENE OF SWIMMING.

Some Feats of Endurance.

PROMINENCE has been given to swimming as a pastime by the remarkable spell of hot weather in this country and by the fact that the English Channel has been crossed in the course of a single week by swimmers starting from either bank. The exploit of an Argentinian has easily broken all previous Channel records. The successful swims are now:—

Date of exploit.	Name of swimmer.	Age.		Distance traversed in miles.	Time.
1875 Aug. 24–25	Matthew Webb	27	Dover–Calais	45	21 h. 45 m.
1911 Sept. 5–6	Thos. Wm. Burgess	40	Dover–Calais	63	22 h. 35 m.
1923 Aug. 5–6	Henry Sullivan	34	Dover–Calais	56	26 h. 50 m.
1923 Aug. 11–12	S. Enrico Tiraboschi	35	Calais–Douvres	—	16 h. 23 m.

Captain Webb, the first champion, was 5 ft. 8 in. in height, weighed 14½ st., and had a chest measurement of 41¾ in. He was freely anointed with porpoise grease before the swim but expressed a doubt whether this benefited him in any way. Much exhausted when he left the water, he yet felt as warm as when he started. He slept several times as he was being driven to his hotel, where his body temperature on arrival was found to be 98° F. On waking five hours later it was 101° F., his face was flushed, and his skin hot and dry. After further sleep he awoke apparently none the worse for his exertions except for stiffness of arms and legs and some trifling abrasions on the neck caused by the salt water. A sphygmographic pulse-tracing, however, which appeared in THE LANCET of Oct. 16th, 1875 (p. 576) excited some comment on the sudden fall of the downstroke and the marked dicrotism. Mr. Burgess's achievement was the more remarkable in that he was almost 6 ft. in height and 13 years Capt. Webb's senior. He was rubbed all over with lard before entering the water. The only food which he partook during his swim consisted of Swiss milk chocolate, a few grapes, and the leg of a chicken. He was just able to walk ashore after his swim. Mr. Sullivan, who is a native of Lowell, Massachusetts, had made repeated attempts to swim the Channel from the age of 20 years. He only took nourishment once during his swim, and walked out of the water and re-embarked for Dover after two hours' rest. Sign. Tiraboschi swam fast and well throughout, drank some coffee at the critical stage of his journey, and did not seem in any distress on landing, when he was rubbed down, and within a quarter of an hour walked to the rowing boat which took him back aboard the French tug.

The Dangers of Swimming Pools.

Swimming has always taken a high place among healthy exercises. It is more and more pushed by organisers o physical training, and year by year the proportion o swimmers increases among the school-children in our inland industrial towns. It is therefore extremely important tha the condition of the water in swimming baths and pool should be as pure as is reasonably possible. This point i raised by Public Health Bulletin No. 133, on the transactions of the third annual conference of State Sanitar Engineers, just issued by the Treasury Department of th U.S.A. A committee in 1921 issued questionnaires to al ear, eye, nose and throat specialists in the United State and to a large proportion of the dermatologists asking fo their experience of diseases thought to have been acquire either from the water, bathing suits, or towels used a swimming baths or pools. Seven hundred replies wer received. Epidemics of mild and acute conjunctivitis wer reported by 19 physicians from 12 cities in 8 States. Epidemics of furunculosis of the external ear, otitis media, an other ear infections were reported by 10 physicians from 11 cities in 9 States. Epidemics of colds, rhinitis, an sinus infections were reported by 4 physicians in 4 citie and a similar number of epidemics of tonsillitis, pharyngiti or laryngitis. Eight epidemics of skin infection wer reported, of which two of impetigo and one of boils wer attributed to infected water, while two of molluscu contagiosum, one of tinea cruris, and one of streptococca infection were attributed to infected bathing suits an towels. One epidemic of typhoid fever was traced to swimming pool at Louisville, Ky.; an epidemic of typhoi in a school camp was traced to bathing in a polluted stream and another intestinal epidemic to a similar cause—a trul formidable list, even if the evidence in every case woul not have convinced a court of justice. One case is mentioned where an investigation made in response to man complaints failed to find evidence of disease acquired fro bathing, but did find that the water was at times highly polluted. It appears from the report that regulations for the control of swimming pools and baths have been adopted in seven States. Liquid chlorine was used as a disinfectant in 27 out of 44 pools with regard to which information was supplied, but at 17 of these pools the bathers complained of the smell or taste or irritating effect of the treated water on the skin or eyes.

Hygienic Precautions.

Some aural surgeons regard public baths as a prolific source of infected ears, witness the correspondence in our own columns following on the announcement in 1921 of an epidemic of swimming-bath conjunctivitis and Eustachian catarrh at Freiburg i. B.[1] The tendency may be to blame the swimming bath overmuch, just as in the early days of sanitation a large proportion of illness was quite unwarrantably put down to defective drains. Then most drains were defective and now a large proportion of the population use swimming pools. Much attention is being given to improving the water of these pools; following the example of Poplar, chlorination and continuous filtration have been successfully adopted at many of them. The deputy city engineer of Hull, Mr. T. Thomas, told the recent Sanitary Institute Congress that Hull has now three continuous filtration plants, and he referred to the Bermondsey plant which had been working satisfactorily at the Rotherhithe baths since 1906. Swimming should be encouraged, and attention concentrated on improving the conditions which in many cases do not come effectively under the purview of the medical officer of health. This is a matter which the Ministry of Health might usefully take up. School medical officers have the opportunity of noticing any deleterious effects of the ever-increasing use of public baths by school-children. Visitors to the Sanitary Congress at Scarborough this year saw the splendid open-air swimming pool constructed by the corporation; a similar pool is nearing completion at Cleethorpes. Every seaside resort worthy of the name should have an open-air swimming pool containing water above suspicion.

PUBLIC HEALTH IN CAIRO.[2]

THE population of the city of Cairo at the middle of 1920 was estimated at 761,300, of whom 72,770 were "foreigners," that is (presumably), non-Egyptians (including H.E. the High Commissioner and the author of this report). It is stated, however, that this estimate (which is a reduction of 387 below the 1917 census) must be considerably below the actual number of inhabitants, as the city has never been more crowded than in the year under review. Also, the village of Kafr-el-Gamûs, with a population of 1200, has been added to the Cairo circumscription during the year; and what is termed "Greater Helwân," embracing a considerable area "attached to the city for all public health purposes, except the registration of births and deaths," with an estimated population of 24,641, brings up the total of Cairo inhabitants to 785,941. upon which figure the zymotic diagrams are based. The birth-rate was 47·3 per 1000, as against 42·0 in 1919 and the same for the quinquennium; as usual, there were great variations in different parts of the city: in Bulâq the ratio was 59·5, in Esbekiya (the European quarter) only 33·1. The death-rate (after deducting 1082 deaths of non-residents) was 36·3 per 1000, as compared with 41·4 in 1919, 49·4 in 1918, and 40·5, the quinquennial mean. The highest district rates were registered in Bulâq (44·6), Old Cairo (44·0), and Khalifa (42·3); while in Helwân and Esbekiya the ratios were only 27·0 and 27·7 respectively. The total number of infantile deaths (after deducting 178 in various institutions, of children from outside Cairo) was 9164, being in a ratio of 255 per 1000 births, as compared with 238 in 1919, and 329 in 1918. In Musky and Helwân districts the ratios were 204 and 212 respectively; in Bulâq and Old Cairo they were 288 and 301. The main cause of death was diarrhœa, which was very prevalent in the hot weather, the mortality being over 30 per cent. of births from the middle of May to the middle of August.

Infectious Diseases.

For infectious diseases as a whole there was a very notable improvement over the experience of the two preceding years; the notifications of the eight principal diseases being only 6·155 per 1000, as compared with 11·659 in 1919, and 10·535 in 1918; the corresponding death-ratios were 1·899, 5·051, and 4·328 per 1000. For small-pox there were only 157 cases recorded (0·199 per 1000), with 50 deaths (0·063 per 1000); but the fatality was high (31·8 per cent.), suggesting that many cases were not reported; indeed, 41 out of these 50 deaths were only diagnosed post mortem, as there had been no medical attendance. In 1919 there had been 1455 cases (1·851 per 1000) and 494 deaths (0·628). It is noteworthy that in the Musky district, where the small-pox death-rate (1·382 per 1000) had been much higher than in any other district of the city in 1919, only eight cases occurred, and not a single death, during the year under report. Possibly vaccination had been resorted to. There was a considerable increase in measles, both in cases (1·685 per 1000) and in deaths (0·514), as compared with the 1919 ratios (0·914 and 0·402); in Saiyeda Zenab the death-rate was 1·1, and in Darb-el-Ahmar 1·749 per 1000. Scarlet fever caused only four deaths in 39 cases. Diphtheria showed a considerable decrease, 0·418 cases and 0·097 deaths per 1000; 37 out of the total 329 cases, and 26 out of the total 77 deaths occurred in Darb-el-Ahmar ward (Rue de la Citadelle); while in Bab-el-Shariya and Helwân there was not a single death. Typhoid fever also was much less prevalent; the total cases numbered 925, less than in any year since 1913, the morbidity being 1·176 and the death-ratio 0·273 per 1000; the case incidence varied from 0·478 in Gamaliya ward to 1·941 in Esbekiya and 2·084 in Wayli; but the highest death-rates were registered in Khalifa ward (0·460) and Old Cairo (0·553). There has been a considerable reduction during recent years in the case-mortality, or fatality ratio, which was 43·2 per cent. in 1916, 24·9 in 1919, and 23·2 in 1920; this may probably be due to more effective notification of cases, which, of course, is most important. Typhus fever was prevalent, but less so than in the two preceding years. The cases and deaths numbered 1606 and 705, giving ratios of 2·043 and 0·897 per 1000; in 1919 the relative ratios were 6·139 and 3·344: the case-mortality was also lower, 43·9 compared with 54·5 per cent. Wayli and Saiyeda Zenab had the largest numbers of cases (198 and 182), but the Musky and Abdin had the highest relative case-incidence (3·138 and 2·663 per 1000), while Darb-el-Ahmar and Old Cairo had the highest death-rates (1·545 and 1·446), the highest fatality ratios occurring in Old Cairo (66·2 per cent.) and Gamaliya (65·8). It may be supposed that the mortality ratios in these diseases are more to be relied on than those of case-incidence. Relapsing fever caused 23 deaths (0·29 per 1000), nine of which occurred in Darb-el-Ahmar; and from cerebro-spinal fever there were 15 deaths (0·019 per 1000), nine of which also occurred in the same ward. There were 1587 cases of influenza with 130 deaths (0·165 per 1000); all the deaths, except eight, occurred between the middle of January and the middle of April; there were also 1518 deaths from pneumonia and broncho-pneumonia, many of these being, no doubt, due to influenza infection. Six cases of encephalitis lethargica were notified, of which five proved fatal. At Qantara three cases of malignant pustule on the cheek occurred among the troops in August, each patient having recently bought a shaving-brush, traced to the same consignment, which had been imported from Japan in June; on examination the medical officer found one of the brushes to be swarming with anthrax bacilli; this was fully confirmed on further examination of the stock of brushes, the unsold portion of which was bought up and destroyed, though, unfortunately, they had been widely distributed in the meanwhile. Subsequent consignments were examined before being released from the Customs, several of which were found to be infected. A law was promulgated forbidding the importation of shaving-brushes, unless accompanied by a certificate from a competent authority of the country of manufacture that efficient disinfection had been carried out, and authorising the destruction of infected consignments, as well as prohibition of importation, if considered necessary.

During the year 1920, 25,169 rooms and 241,760 articles of clothing were disinfected by the Abbasiya and Fum-el-Khalig services, formalin, sublimate solution, and cyllin being used for the premises, and steam for the clothing. A "delousing campaign" was also instituted against typhus and relapsing fever, the number of contacts deloused being 1979. At the Government Fever Hospital, Abbasiya, there were 3152 admissions, as compared with 5530 in 1919; the chief diseases treated were typhus (918 admissions), relapsing fever (568), influenza (546), typhoid (172) and small-pox (109); the case-mortality ratios were 27·7, 1·2, 1·2, 32·5, and 32·1 per cent. respectively. The number of uncertified deaths which required investigation because there had been no medical attendance during the last illness was 18,814—that is, 68·1 per cent. of the total deaths that occurred in the city; this ratio is lower than in any recent year (since 1913), but still very high; in Bulâq, Old Cairo, and Khalifa districts the ratios were 83·4, 84·4, and 85·6 per cent.; in Esbekiya only 23·3 per cent.

Preventive Measures.

The condition as regards infant vaccination does not appear to be quite satisfactory; there were 30,215 primary vaccinations of native children, which works out at 85·8 per cent. of the births, a fairly high and satisfactory ratio; but of the 656 children of foreign birth only 408 were vaccinated—that is, 62·2 per cent.; the nationality of these children is not stated. An important part of the public health organisation is that of the Passenger and Pilgrim Control Service; as many as 7951 persons arrived in Cairo from countries under supervision on account of being infected, a considerable increase on the arrivals (4288) in the previous year. The largest numbers (2958 and 2301) came from Syria and Turkey; 58 per cent. landed at Alexandria and 32 per cent. at Port Said, the remainder at Suez. In addition 19,646 Egyptian Labour Corps men from the Canal Zone required to be observed on entering Cairo. The supervision of "unhealthy, inconvenient, and dangerous establishments" (such as bakeries, groceries, dyeworks, stables, &c.) is another important, and difficult, duty; the conditions were found to be faulty in only 6·60 per cent. of the 14,667 inspection visits, an increase, however, on the ratio (5·5) in 1919; bakeries (26·8 per cent.) and confectionery establishments (22·0 per cent.) were the worst; but among the grocers (4613) and butchers (3558), which between them compose more than half the total, faulty conditions were found in only 4·0 and 1·1 per cent. respectively; even in dairies and milkshops not more than 14·6 per cent. were found to be unsatisfactory. At all police stations and outposts suitable arrangements have now been made for the reception and examination of injured persons, and police officers have been instructed in the elements of first-aid; a specially arranged medical chest has also been supplied for each fire-brigade motor. All men joining the police force are now vaccinated, and an anti-lice campaign has been instituted as a protection against typhus and relapsing fever. The amount of medical work carried out by the police medical officers appears to have been very considerable; as many as 8036 examinations of persons were made for injury or supposed injury (compared with 6029 in the previous year); 2088 cab-drivers and carters were examined for the Traffic Office, and 3219 *ghafirs* on account of sickness. Anti-mosquito work was carried out in certain selected areas where the inhabitants allowed access to their premises for dealing with possible breeding places; the Gezira area has benefited materially by the drainage work carried out in 1919–20. At Helwân *Culex* is found in the town almost exclusively and *Anopheles* in the outskirts.

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[1] THE LANCET, 1921, ii., 519 et seq.

[2] Government Press, Cairo. 1921.

At the conclusion of this most interesting report, Dr. P. G. S. Williams, medical officer of health for the city, mentions a measure likely to prove of great value to the public health that is being carried out in the smaller streets of the native quarters; this consists in laying down a paving of cubical stone setts, placed upon a clean sand foundation, and giving an impermeable surface, which can be kept clean. An improvement in the health of the inhabitants may be hoped for in the quarters so dealt with, and especially in the incidence of infantile diarrhœa. The report is well illustrated with diagrams and tables, and extremely well printed; the addition of a plan of the city, showing its present divisions, might be suggested.

THE EFFECT OF BACTERIAL EXTRACTS ON BLOOD-SUGAR.

IT is well known that substances such as peptone and certain proteins contained in yeast will lower blood-sugar when injected subcutaneously. Hopes were raised early in the year that "yeast insulin" might prove an effective remedy and that quantities of it would be available for clinical trial in the near future. In the current issue of *Nature* Messrs. L. B. Winter and W. Smith report briefly on their further work at the Biochemical Laboratory in Cambridge. They have now obtained from the action of micro-organisms, other than yeast, extracts which lower the level of blood-sugar in normal animals to a point where convulsions occur. These convulsions were relieved by injection of glucose, so that it is presumed they were not due to toxic substances in the injections. Such extracts seem to lower the level of blood-sugar for a longer time than does insulin itself, and it remains to be seen whether they can be utilised in the treatment of diabetes. Experiments to this end are being continued and will be followed with interest.

TO PARENTS OF DEFECTIVE CHILDREN.

A LITTLE book entitled "Opening Doors" (London and Edinburgh: Oliver and Boyd. 1923. Pp. 20. Cloth 1*s.* 6*d.*, paper 6*d.*) has been written by Dr. John Thomson for the mothers of mentally defective infants "in the hope that it may provide them with some of the instruction and encouragement of which they are often much in need." In the early months of a baby's life it is the mother who almost invariably has the best and sometimes the only opportunity of discovering whether her baby's development differs from that of a normal infant; and where this is the case there are many ways in which she can help him, many doors which she can at least place ajar for him, if any abnormality present be recognised sufficiently early. At present, as Dr. Thomson points out, a large proportion of mentally defective children begin to be educated for the first time when they are between 5 and 7, having had practically no training during the earlier and more receptive years of life; and the circulation of information of the kind contained in this book cannot but make the subsequent training of such children easier. The advice given is simple but eminently practical, and is so worded as not to offend the most susceptible of mothers. She is shown what she can do for her baby if he is forming bad habits; if he is doing or noticing too little; if he is late in speaking, cries constantly, or has fits; and how she can strengthen his character and keep him strong and well. Suggestions are given for the special treatment of children whose limbs are stiff, these including active and passive movements, as well as a number of miscellaneous common-sense hints. The value of this small book is out of all proportion to its size, and it should meet with a warm welcome not only from mothers, but also from child welfare workers, nurses, and even doctors.

A TUBERCULOSIS DIRECTORY.

A FOURTH edition has just appeared of the useful Handbook of Tuberculosis Schemes, issued by the National Association for the Prevention of Tuberculosis (20, Hanover-square, London, W. 1. 10*s.* 6*d.*, post free). Its aim is to give ready and trustworthy information regarding the operation of tuberculosis schemes and other tuberculosis activities throughout Great Britain and Ireland, to produce, in fact, a tuberculosis directory as far as mortality and provision for control and treatment are concerned. Any complete tuberculosis scheme, as the foreword indicates, includes the operations of a care-committee, and it is satisfactory to note that in a number of instances local authorities have frankly coöperated with voluntary agencies and have included in their schemes institutions established and maintained on voluntary lines. The Handbook now contains a number of tables and graphs effectively showing the varying death-rates in counties and boroughs for the year 1922. It will be found helpful by all who are interested in the development and administration of sound anti-tuberculosis measures.

THE SAN FRANCISCO MEDICAL MEETING.

THE recent annual meeting of the American Medical Association at San Francisco was attended by over 3750 medical men, this number exceeding that of 1915—when the Association last met in that city—by nearly 1500. The extensive publicity given by the press to the proceedings of the session is believed by Californian physicians to have been of great service in combating the advertising of non-medical cults which are particularly powerful in that State. The sessions of the House of Delegates, the governing body of the Association, were fully and closely attended, and many problems of professional and public importance were discussed. An innovation was introduced in the shape of clinics held in connexion with the meeting, both before and after it, throughout the Pacific Coast and Western States, in order to bring home the scientific work of the Association to those who were unable to be present at the actual gathering in San Francisco. At the first meeting of the House of Delegates on June 25th the Speaker, Dr. Frederick C. Warnshuis, of Grand Rapids, Mich., claimed that certain members and parts of the Association had during the past year used the promulgation of public health measures as an excuse to justify "the institution of socialised medicine for all classes of society," and that on that account "condemnation and ridicule are directed to the profession as a whole." If unity of purpose was to be nullified by the acts and attitude of certain special groups of members, the Association might as well withdraw from the public arena and concern itself only with purely scientific topics. Others of Dr. Warnshuis's recommendations referred to increased representation of the Association in the group of medical authorities who have been discussing, and are again expected to discuss, the organisation of a national welfare department in Washington, and to the cessation of any necessity for the Red Cross organisation to enter into public health or community clinic work. Dr. George E. de Schweinitz, of Philadelphia, President of the Association, spoke in his address of the ever-present question of the time which should be devoted to specialties in the undergraduate curriculum, and suggested that from the central offices of the Association a questionnaire of wide scope should be sent to graduates of representative schools of medicine in various parts of the country prior to the next meeting on medical education, and that an analysis of the replies received should be presented as a basis of discussion. Dr. Ray Lyman Wilbur, of California, President-elect, emphasised the necessity in medical affairs of decentralisation of organisation, in order that the special needs of each State might be met by those who best knew its problems. Dr. Wilbur also referred to the increasing interest throughout the country in the practice of periodical physical examination; the doctor trained to thinking in terms of disease must, he said, turn his attention to thinking in terms of being well.

STUDENTS' GUIDE—SESSION 1923-1924.

THE scheme upon which the Students' Number of THE LANCET is constructed will make it easy, we hope, for all who consult it to find what they seek. The General Council of Medical Education and Registration is the controlling authority of all the medical and dental education of the country, and its responsibility for the upkeep of the Medical Register and for the maintenance of the examination standard is first explained. But the student has to be taught as well as examined, and as the systems under which instruction can be obtained do not conform to one pattern, the various curricula are described in detail, and under their respective headings the necessary information will be found concerning the facilities for medical study offered at the different teaching centres of the United Kingdom. The regulations for the examinations, both preliminary and professional, at these centres are set out so that the student desiring to obtain a medical degree from any university, or a diploma from any medical corporation, may ascertain the course of clinical instruction and the conditions under which submission for examination has to take place. The metropolitan medical schools and hospitals are grouped under the University of London, of which they are constituent bodies, although their educational opportunities are offered to students of other universities as well as to those seeking the qualifications of the medical corporations. A similar plan is adopted in dealing with the provincial universities, the hospitals in direct connexion with which are described with the universities; the hospitals may not be official schools of the universities, but they supply an integral section of the teaching required. Upon securing degrees or diplomas admission to the Register follows, and greater education begins. The prudent young doctor already knows what he or she desires to make the next step, and there is a large range of choice displayed. The inducements to enter one of the Services should prevail more than they have done of recent years. An account is given of the conditions under which commissions can be obtained in the Navy, Army, Indian, and Air Force Medical Services, and in the Colonial Medical Service.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

POWERS, DUTIES, AND CONSTITUTION OF THE GENERAL MEDICAL COUNCIL.

THE powers and duties of the General Medical Council, or "General Council of Medical Education and Registration of the United Kingdom" to give the Council its full title, have been set out in detail in many previous Students' Numbers of THE LANCET. It is first a registering body: no person, even though his qualifications have been obtained by examination, is a legally qualified medical practitioner until his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that medical education reaches an efficient standard by scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner adjudged guilty of conduct "infamous in a professional respect." Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council at present consists of 38 members, of whom, as will be seen by the annexed list, all but 11 are official representatives of some corporate body. Five members are chosen by the Crown on the advice of the Privy Council, and six others are elected by the members of the medical profession as Direct Representatives. There are also three additional members appointed by the Privy Council under the Dentists Act, 1921, under which the powers and duties of the General Medical Council with regard to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the Dental Board of the United Kingdom (see p. 432).

President of the General Council: Sir Donald MacAlister. Members of the General Council: Sir Humphry Rolleston, chosen by the Royal College of Physicians of London; Mr. H. J. Waring, F.R.C.S., Royal College of Surgeons of England; Dr. Benjamin Bloomfield Connolly, Apothecaries' Society of London; Mr. Arthur Thomson, F.R.C.S., University of Oxford; Dr. Wynfrid Laurence Henry Duckworth, University of Cambridge; Dr. Robert Howden, University of Durham; Sir Sydney Russell-Wells, University of London; Dr. Robert B. Wild, Victoria University of Manchester; Sir Gilbert Barling, University of Birmingham; Dr. Richard Caton, University of Liverpool; Dr. Thomas Wardrop Griffith, University of Leeds; Mr. John Beresford Leathes, M.B., University of Sheffield; Sir Isambard Owen, University of Bristol; and Dr. David Hepburn, University of Wales. Dr. William Russell, chosen by the Royal College of Physicians of Edinburgh; Sir James Hodsdon, Royal College of Surgeons of Edinburgh; Dr. James Alexander Adams, Royal Faculty of Physicians and Surgeons of Glasgow; Dr. H. Harvey Littlejohn, University of Edinburgh; Sir Donald MacAlister, University of Glasgow; Dr. Matthew Hay, University of Aberdeen; and Dr. John Yule Mackay, University of St. Andrews. Sir John William Moore, chosen by the Royal College of Physicians of Ireland; Sir Arthur Gerald Chance, Royal College of Surgeons in Ireland; Dr. Edward Magennis, Apothecaries' Hall of Ireland; Dr. Andrew Francis Dixon, University of Dublin; Dr. Denis Joseph Coffey, National University of Ireland; and Mr. Thomas Sinclair, F.R.C.S., Queen's University of Belfast. Nominated by His Majesty, with the advice of his Privy Council: Sir Francis Henry Champneys, Sir George Newman, Sir Nestor Tirard, Sir Leslie Mackenzie, and Sir Edward Coey Bigger. Elected as Direct Representatives: Dr. J. A. MacDonald, Sir Thomas Jenner Verrall, Dr. Robert A. Bolam, Mr. E. B. Turner, Sir Norman Walker, and Dr. Leonard Kidd. Treasurers of the General Council: Mr. H. J. Waring and Sir George Newman. The three additional members are Mr. William Henry Dolamore, M.R.C.S., L.D.S.; Mr. William Henry Gilmour, M.D.S., L.D.S., and Mr. William Guy, F.R.C.S.E., L.D.S.

THE EDUCATIONAL CURRICULUM.

Professional Education.—The course of professional study after registration occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

The following are the General Medical Council's Regulations in regard to the registration of medical students which came into force on Jan. 1st, 1923.

Registration of Medical Students.

1. Subject to such exceptions as the Council may from time to time allow, every medical student, at the commencement of his studies, should be registered in the manner and under the conditions hereinafter set forth.

2. Before registration as a student every candidate should produce evidence that he has attained the age of 17 years.

3. The minimum standard of General Education required is that of University matriculation or entrance examination in the Faculties of Arts or Pure Science.

4. Before registration as a student every applicant should be required to have passed an approved examination in general education, and, in addition thereto, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies.

5. A student who has diligently attended an approved course of instruction in elementary biology at a secondary school or other teaching institution recognised by a licensing body may be admitted to the professional examination in elementary biology immediately after his registration as a student.

6. The commencement of the course of professional study recognised by any of the licensing bodies should not be reckoned as dating earlier than 15 days before the date of registration.

7. Every person desirous of being registered as a medical student should apply to the registrar of the division of the United Kingdom in which he is residing, according to a prescribed form, copies of which may be had on application to the several licensing bodies, medical schools, and hospitals, or at the offices of the Medical Council; and should produce or forward to the registrar evidence that he has attained the age of 17 years, that he has passed a preliminary examination in general education recognised by the General Medical Council, and, in addition, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies, and that he has commenced medical study.

Regulations which the Council has prescribed for the maintenance of the register of medical students:—

1. It shall be delegated to the Education Committee to prepare and issue from time to time a list of examining bodies whose examinations in general education fulfil the conditions of, and are specially recognised by, the General Medical Council.

2. The Council has recognised the undernoted university examinations, subject to the conditions specified below: viz., at Oxford University, Responsions; at Cambridge University, the Previous Examination; at the Scottish Universities, the Preliminary Examination; and the Matriculation Examination at the Universities of Birmingham, Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, and Wales.

3. The conditions prescribed by the Council are:—(1) The standard of the examination shall not be lower than that of the University Matriculation Examinations in the Faculties of Arts and Pure Science. (2) The certificate shall bear evidence that the candidate has passed in the following subjects, viz.:—(*a*) English. (*b*) Mathematics, Elementary. (*c*) A language other than English. (*d*) An additional subject or subjects, as required by the regulations of the particular examination, to be chosen from the subjoined list, viz.: History, Geography, Physical Science, Natural Science, Latin, Greek, Hebrew, French, German, or other language accepted by the University for the purpose.

4. Subject to the conditions specified above (Section 3, Subsection (2)), the Council will recognise all examinations conducted by recognised authorities in Great Britain accepted by one or more of the above-named Universities as equivalent for purposes of Matriculation to an examination named in the preceding list (Section 2). Bristol University: Higher School Certificate Examination; Schools Certificate Examination. Cambridge Local Examinations and Lectures Syndicate: Higher School Certificate Examination; School Certificate Examination. Central Welsh Examination Board: Senior Certificate Examination. Durham University: Higher Certificate Examination; School Certificate Examination. London University: General School Examination; Higher School Certificate Examination. Northern Universities Joint Matriculation Board: Higher Certificate Examination; School Certificate Examination. Oxford and Cambridge Schools Examination Board: Higher Certificate Examination; School Certificate Examination. Oxford Delegacy for Local Examinations: Higher School Certificate Examination; School Certificate Examination. Scottish Education Department: Leaving Certificate Examination.

5. The Council will continue to recognise examinations conducted by educational bodies other than those (referred to in Section 4) directly recognised by the Universities of Great Britain. Recognition will not be extended under this section to any examination unless the Council is satisfied (1) that in scope and standard it is equivalent to a recognised Matriculation Examination of a British University, and (2) that it fulfils the conditions specified by the Council (Section 3, Sub-section (2)). Such examinations are:—The College of Preceptors (England): Senior Certificate. The Educational Institute of Scotland: Preliminary Medical Certificate.

Examinations in Ireland.—6. Subject to the specified conditions (Section 3, Sub-section (2)), the Council will recognise the Entrance Examination to the School of Physic of the University of Dublin, the Matriculation Examinations of the National University of Ireland and the Queen's University of Belfast, and the Preliminary Examination of the Irish Royal Colleges of Physicians and Surgeons, and all examinations accepted by one or more of these bodies as equivalent for purposes of entrance or Matriculation, to the above-named examinations.

7. The Council will recognise the Final Examinations for Degrees in Arts and Science of any University of the United Kingdom or of the British Dominions.

Colonial Examinations.—8. Subject to the specified conditions (Section 3, Sub-section (2)), the Council will recognise all examinations of Colonial Universities which are accepted by one or more of the British Universities as equivalent, for purposes of Matriculation, to an examination named in the list of examinations recognised by the Council (Section 2).

The registration of medical students is placed under the charge of the Branch Registrars.

A copy of the Medical Students Register prepared by each of the Branch Registrars is transmitted, on or before Dec. 31st in each year, to the Registrar of the General Council, who supplies an alphabetical list of all students registered in the preceding year to each of the licensing bodies in the United Kingdom, and to each of the several medical schools and hospitals.

All applications for special exceptions to the foregoing regulations as to registration should be addressed to the Registrar of the General Council.

Lists of Universities (including their Colleges and Medical Schools) and Schools of Medicine at which Medical Study may be Commenced in the United Kingdom.—1. Universities (including their colleges): Aberdeen University; Belfast, Queen's University; Birmingham University; Bristol University; Cambridge University; Dublin University (including Trinity College); Durham University (including the Durham College of Medicine, and the Armstrong College of Science, Newcastle-upon-Tyne); Edinburgh University; Glasgow University (including Queen Margaret College); Ireland, National University (including University College, Cork; University College, Dublin; University College, Galway); Leeds University; Liverpool University; London University (including the following Schools and Colleges: St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College, King's College Hospital, London Hospital, St. Mary's Hospital, Middlesex Hospital, St. Thomas's Hospital, University College, Westminster Hospital, London (Royal Free Hospital) School of Medicine for Women; Bedford College, Royal Holloway College; Manchester, Victoria University; Oxford University; St. Andrew's University (including University College, Dundee); Sheffield University; Wales, University of (including University College of Wales, Aberystwyth; University College of North Wales, Bangor; University College of South Wales and Monmouthshire, Cardiff; Welsh National School of Medicine, Cardiff; University College, Swansea). 2. Schools of Medicine Recognised by the Licensing Bodies:—Dublin: Royal College of Surgeons, Schools of Surgery; Edinburgh: School of Medicine of the Royal Colleges; Glasgow: Anderson's College, St. Mungo's College.

The address of the Registrar, to whom further communications should be addressed, is as follows: The Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1.

THE MEDICAL EXAMINING BODIES AND SCHOOLS OF THE UNITED KINGDOM.

A GUIDE TO THE FACILITIES FOR OBTAINING THE VARIOUS MEDICAL DEGREES AND OTHER QUALIFICATIONS FOR THE BRITISH MEDICAL REGISTER.

I.—ENGLAND AND WALES.

THE UNIVERSITIES.

UNIVERSITY OF OXFORD.[1]

THIS University confers two degrees in Medicine, those of B.M. and D.M., two in Surgery, *B.Ch.* and *M.Ch.*, and diplomas in *Public Health and Ophthalmology.*

Only Graduates in Arts of the University are eligible for the Medical and Surgical degrees. The most convenient course for the B.A. degree for intending graduates in Medicine is to take Responsions, the Preliminary Science Examinations mentioned below, and the Final Honour School of Physiology. To obtain the degrees of B.M. and B.Ch. the following examinations must be passed: 1. Preliminary subjects: Physics and Chemistry, Zoology, and Botany. 2. Professional. (*a*) First Examination: Subjects—Organic Chemistry, unless the candidate has satisfied the examiners in Part I. Chemistry in the Honour School of Natural Science; Human Physiology, unless he has obtained a First or Second Class in Animal Physiology in the Honour School of Natural Science: Human Anatomy. (*b*) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology. The First and Second Professional examinations are held in June and December. The first B.M. examination may be passed at any time after the Preliminary Scientific examinations. Anatomy and Physiology must be passed at the same time—Organic Chemistry may be taken separately.

At any time after passing the First Examination, the candidate can, on producing certificates, present himself for examination in the subjects of Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology; but cannot enter for examination in Medicine, Surgery and Midwifery until the eighteenth term from his matriculation, nor until a period of at least twenty-two months has elapsed from the date of passing the First B.M. Examination. He must take Medicine, Surgery and Midwifery at one and the same time.

Before admission to the Second B.M. Examination, the student must produce certificates of having attended laboratory courses in Pathology, Bacteriology and Pharmacology either in Oxford or in a recognised medical school. He must also produce certificates of having acted as Clinical Clerk and Dresser, each for six months, in a medical school approved by the University, of three months post-mortem clerking, of attendance on Labours, of instruction in Infectious Diseases and Ophthalmology, and of proficiency in vaccination and the administration of anæsthetics.

The degree of B.Ch. is granted with that of B.M. after passing the above examinations. The degree of D.M. is granted to Bachelors of Medicine of the University who have entered upon their thirtieth term from Matriculation, and have submitted a dissertation which is approved by the examiners for the B.M. degree whose subjects are dealt with therein and by Professors in the Faculty of Medicine. The degree of M.Ch. is granted after examinations to Bachelors of Surgery in the University who have entered upon their twenty-first term, and who are Members of the Surgical Staff of a recognised hospital, or have acted as Dresser or House Surgeon in such a hospital for a period of six months. The examination, which includes Surgery, Surgical Anatomy and Pathology and Surgical Operations, is held annually in June, after the Second B.M. examination.

The examinations for the Diploma in Public Health[2] in two parts are held in Trinity and Michaelmas terms; that for the Diploma in Ophthalmology is held annually, commencing on the third Monday in July.

For the Diploma of Ophthalmology attendance at a course of instruction in Oxford, lasting two months, is obligatory. Candidates must be registered medical men, unless, being Bachelors or Doctors of Medicine of Universities outside the United Kingdom, they have obtained special permission from the Board of the Faculty of Medicine.

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for two years and of the annual value of £300. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Radcliffe Library, University Museum. A Christopher Welch Scholarship of £100, tenable for four years, is awarded annually after examination. Candidates must be men undergraduate members of the University, who have not exceeded the twelfth term from their matriculation, or been admitted to any degree in the University. They may offer any one of the subjects, Animal Physiology, Botany, Zoology. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially (alternating with the Rolleston Memorial Prize) for research in some branch of medical science. The Theodore Williams Scholarships, each of the value of £50 a year for two years, are awarded annually in the subjects of Anatomy, Physiology, and Pathology. A Radcliffe Scholarship in Pharmacology, of the value of £50 for one year, is awarded annually by the Master and Fellows of University College. A King's College Hospital Burney Yeo Scholarship of £80 is awarded each year. The Scholarships and Exhibitions in Science which are offered by most Colleges are open to those who intend to pursue Medicine. The value of these scholarships is usually £80 a year for four years; the exhibitions vary in value from £30 to £90 per annum. The number of scholarships and exhibitions in Science offered annually is about forty. There are also Medical Scholarships of the value of £100 a year at University College and at Pembroke College. The Welsh Memorial Prize for Anatomical drawing is awarded annually, and is of the value of about £10.

In addition to the University Lectures and classes the several Colleges provide their undergraduates with tuition for all examinations up to the B.A. degree.

In the Radcliffe Infirmary and County Hospital clinical instruction is given by the Regius Professor of Medicine, the Litchfield Lecturers in Medicine and Surgery, and the other physicians and surgeons. Instruction is also given in post-mortem work and Clinical Pathology in connexion with the courses in Pathology. Post-graduate courses are held at the beginning of October.

More detailed information may be obtained from the University Calendar; from the Examination Statutes, 1922 (both of which are published by the Clarendon Press); from the Regius Professor of Medicine; from the Professors in the several departments of medical science; and from the Dean of the School of Medicine, Department of Medicine, Museum, Oxford.

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[1] Vide "Information concerning the School of Medicine, Medical Degrees and Diplomas, and Post-Graduate Medical Study and Research." Oxford, at the Clarendon Press, 1s. net.

[2] The regulations for the Diplomas in *Public Health* of the various Examining *Bodies* will be found on page 428.

UNIVERSITY OF OXFORD: RADCLIFFE INFIRMARY AND COUNTY HOSPITAL.—Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) Clinical lectures by the Litchfield Lecturers in Medicine and Surgery; and (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation. (4) Pathological demonstrations and instruction in post-mortem work are given by the Assistant Pathologist. Opportunities are offered to students who wish to act as surgical dressers and clerks. The hospital contains 210 beds. In connexion with the hospital there is usually held in each year during October a post-graduate course, lasting a week.

UNIVERSITY OF CAMBRIDGE.

The student must enter at one of the Colleges, or as a non-collegiate student, and keep nine terms (three years) by residence in the University. He must pass the Previous Examination in Classics, Mathematics, &c., if possible, before he comes into residence in October, or he may obtain exemption through the Oxford and Cambridge Schools Examination Board, the Oxford or Cambridge Senior Local Examinations, the London Matriculation Examination, the Scotch Education Department, Responsions at Oxford, and the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield, the Matriculation Examination of the University of Birmingham, or by being a graduate of certain other Universities in the United Kingdom. He may then devote himself to medical study in the University, &c. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing two Special Examinations for the ordinary B.A. degree, or an Honours degree in one of the Triposes. The Natural Sciences Tripos is taken most frequently, as some of the subjects are practically the same as those for the first and second M.B.

For the degree of *Bachelor of Medicine* (*M.B.*) five years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three or four years are usually spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the first and second examinations for M.B. Hospital practice and many of the requisite lectures may be attended in Cambridge, and some students remain to attend lectures and hospital practice until they have passed the second part of the second examination for M.B. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The *first* includes (1) General and Chemistry, (2) Mechanics, (3) Physics, and (4) Elementary Biology. These parts may be taken together or separately. The *second* is divided into three parts—viz., (1) Organic Chemistry, (2) Human Anatomy and Physiology; and (3) Pharmacology and General Pathology. The *third* is divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept in the Public Schools, by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic.

Candidates who have passed both parts of the third M.B. examination are admitted to the registrable degree of *Bachelor of Surgery* (*B.Ch.*) without separate examination and without keeping an Act.

The degree of *Doctor of Medicine* (*M.D.*) may be taken three years after that of M.B. or four years after that of M.A. The candidate is required to produce certificates of having been engaged in Medical Study for five years, and if an M.A., to pass the same examinations as are required for the degree of M.B. An Act has to be kept, consisting of an original Thesis sustained in the Public Schools with *vivâ voce* examination; and a short extempore essay has to be written on a topic taken from the general subject of his thesis, whether it be Physiology, Pathology, Pharmacology, the Practice of Medicine, State Medicine, or the History of Medicine.

For the degree of *Master of Surgery* (*M.Ch.*) the candidate must have passed all the examinations for B.Ch., or, if he is an M.A., have obtained some other registrable qualification in surgery. He is required to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject. Before he can be admitted to the examination two years at least must have elapsed from the time when he completed all required for the degree of B.Ch.

New regulations for Medical and Surgical Degrees are being drafted, to come into force in October next.

Diplomas are granted in Public Health, in Tropical Medicine, in Medical Radiology and Electrology, and in Psychological Medicine. Candidates must hold a recognised medical qualification.

Women Students.—Increased facilities have been offered to students of Girton and Newnham Colleges, and they are admitted to the First and Second M.B. Examinations under certain conditions.

University Prize in Medicine.—The one University Prize in Medicine, the Raymond Horton Smith Prize (value £19), is awarded to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a tripos examination. Medical studies are endowed by the numerous Natural Science scholarships at the various colleges, information about which can be obtained from the respective Tutors.

An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Physics, Biology, Pharmacology, and General Pathology may be obtained upon sending a stamped directed envelope to the Registrary, The Registry, Cambridge.

Diploma in Medical Radiology and Electrology.—This Diploma is granted by the University of Cambridge. The primary object is to provide adequate training in a branch of medical work which is becoming increasingly important and difficult, and which is outside the ordinary medical curriculum. The Diploma is only open to those who hold a medical qualification, and includes a course of lectures and practical work in physics (Part I.), and in Radiology and Electrology (Part II.). Attendances at the necessary course of lectures in both subjects and in addition six months' clinical experience in an adequately equipped hospital recognised by the Committee is essential. The whole course of study takes six months, the lectures, practical work, and hospital attendance running concurrently. The Courses carried out by the University of Cambridge are at present arranged to begin early in January. Three months are spent in Cambridge doing the lectures and practical work in Part I., attending the systematic lectures in Part II., and the practice of Addenbrooke's Hospital, where there is a fully equipped and up-to-date X ray and Electrological Department. The remaining three months can be completed at any recognised hospital, but special arrangements are made for students to continue their studies in London, where demonstrations at various hospitals are arranged in order to give a wide experience. In addition, an independent course is arranged by the British Association of Radiology and Physio-Therapy. This Course is held entirely in London, but is recognised by the University as qualifying for the examination, and begins early in October. Further particulars as to the Cambridge Course can be obtained from Dr. F. Shillington Scales, Medical Schools, Cambridge, and of the London Courses from Dr. Stanley Melville, at the Offices of the B.A.R.P., 12, Stratford Place, London, W. 1.

ADDENBROOKE'S HOSPITAL.—Clinical Lectures in Medicine and Surgery, in connexion with Cambridge University Medical School, are given at this hospital twice a week during the academical year; and practical instruction in Medicine and Surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations. The fee for pupilship is 3 guineas a term, 9 guineas a year, 12 guineas perpetual. Further information may be obtained from Dr. Aldren Wright.

UNIVERSITY OF LONDON.

The University of London was established by Royal Charter in 1836 as an examining and degree conferring body with affiliated colleges but no direct teaching functions. In 1900 it was reconstituted under the Act of Parliament, 1898, and became a teaching as well as an examining body. Many schools already existing became constituent colleges, including all the metropolitan medical schools. Lecturers were also appointed in special subjects.

Teaching Staff.—The teaching staff of the University is organised under two heads: 1. Appointed teachers—i.e., such as are appointed by the University. 2. Recognised teachers—i.e., those who have been appointed and are paid by the several schools of the University and other institutions at which instruction is given under the auspices of the University, and who have been recognised by the Senate as conducting work of University standard. Courses by non-recognised teachers may also be approved in schools of the University. The lecturers in the Medical Sciences and the professors in the Faculties of Medicine in University College, London, and King's College, London, will be found enumerated under their respective schools.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who have matriculated at the University and who are pursuing a course of study approved by the University, either (*a*) under the direct control of the University or a committee appointed thereby; or (*b*) under one or more of the appointed or recognised teachers of the University. Centres for preliminary and intermediate medical studies have been established by the University at University and King's Colleges. Internal students must pursue their studies at one of the above centres, or at one of the medical schools connected with the University. These are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. The London School of Tropical Medicine and the Lister Institute of Preventive Medicine are also recognised as schools of the University in special departments. External students are all other matriculated students, and may pursue their studies at other universities and medical schools, presenting themselves for examination at the University.

Faculty of Medicine.—The Faculty of Medicine grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), the higher separate degrees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D.S. (*Bachelor of Dental Surgery*).

The curriculum for the M.B., B.S. degrees is five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University, to be obtained from the Principal Officer, University of London, South Kensington, S.W. 7.

A. *Internal Students.*—For the Bachelor's degrees in Medicine and Surgery a student must normally, after registration as an internal student, have: (1) *Attended* prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (*a*) The First Examination for Medical Degrees in Inorganic Chemistry, Physics, including Mechanics, and General Biology; (*b*) the Second Examination for Medical Degrees: Part I., Organic Chemistry, including Bio-Chemistry: Part II., Anatomy, Physiology, and Pharmacology; (*c*) the Third Examination for Medical Degrees, or M.B., B.S. Examination in Medicine, Surgery, Obstetrics and Gynæcology, Pathology, Forensic Medicine, and Hygiene.

B. *External Students.*—For the Bachelor's degrees in Medicine and Surgery an external student must (1) have passed the Matriculation examination or have been exempted therefrom under Statute 116 not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to Matriculation and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools.

The First Examination for Medical Degrees (Inorganic Chemistry, Physics, including Mechanics, and General Biology) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (Part I.): Organic Chemistry, including Bio-Chemistry.—This examination will take place twice in each year, commencing on the Tuesday following the third Monday in March and on the second Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the fourth Monday in October and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; and (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser: (8) Clinical Surgery; (9) Ophthalmology: (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery; (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology; (13) Lying-in-Hospital; (14) The conduct of at least 20 Labours; (15) Ante-natal Clinic; (16) Experience as a

Clinical Clerk in Gynæcological Work; (17) General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-Mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together. The list of candidates who have passed will be published in two parts—namely, an Honours list and a Pass list. Bachelors of Medicine of this University who graduated in or before May, 1904, may obtain the B.S. degree by passing the Surgical part of the M.B., B.S. examination.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis or published work having definite relation to the branch of Medicine in which he is a candidate, and if the thesis be approved by the examiners the candidate may be exempted from a part or from the whole of the written examination in that subject.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year and commences on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology and Rhinology. A thesis may be submitted as for M.D.

Fees.—Matriculation £2 12*s.* 6*d.* for each entry. at provincial examinations an additional local fee is charged. First examination for Medical Degrees: £6 6*s.* for each entry to the entire examination. For re-examination in one subject the fee is £2 2*s.* Second examination, Part I. £3 3*s.*, repeated on each subsequent entry; Part II. £9 9*s.* for the whole examination. Third examination: £12 12*s.* for each entry to the whole examination. M.D. Examination: £21; for re-examination £10 10*s.* M.S. Examination: As for M.D.

Full details of the prescribed curricula of study and the names of the recognised Internal and External Schools of the University, can be obtained free on application to the Principal Officer, University of London, South Kensington, S.W.7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 for convalescent patients at Swanley. It receives over 9000 in-patients annually and its out-patients and casualties amount to more than 75,000 annually. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electro-therapeutics and X Ray work. Surgical operations take place every day, except Saturdays, at 1.30 P.M., and Surgical consultations are held on Thursdays at the same hour. Medical consultations are held on Thursdays at 3.15 P.M. The physicians and surgeons deliver clinical lectures weekly during both the winter and the summer sessions. Clinical lectures on all special subjects are also given. Wholetime Clinical Units under Professors of Medicine and Surgery have been established.

Ten house physicians and ten house surgeons are appointed annually, and are provided with rooms and board by the hospital authorities and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear are appointed every six months, and are provided with rooms and board, and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum, with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential college is attached to the hospital.

New Buildings.—The new buildings comprise residential quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the Medical College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, pathological histology, and pathological chemistry. *The Medical School Buildings* include three large lecture theatres, a large dissecting room, a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is the most complete in the kingdom. There are laboratories for chemistry, physiology, pharmacology, physics, public health, and biology, giving ample accommodation in every department.

Special Classes for the Primary and Final *F.R.C.S.* are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. *Laboratory Instruction for the D.P.H.* is provided during the winter and summer sessions. Facilities for research work are afforded in the Clinical Units and the *Laboratories* of the pathological and other departments. The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Scholarships given in aid of Medical Study.—At this school various Scholarships, prizes, &c., are given. For five of the Scholarships and the Exhibition—namely, (*a*), (*b*), two Entrance Scholarships of the respective values of £75 and £100; (*c*) Entrance Scholarship in Arts, £100; (*d*) Jeaffreson Exhibition, £50; and (*e*) Shuter Scholarship, £50—a full or University course at St. Bartholomew's Hospital is required. The awards of (*a*) and (*b*) are made after examination in selections from the subjects of Chemistry, Physics, Zoology, Botany, Physiology, and Anatomy; (*c*) and (*d*) are awarded after examination in Latin, Mathematics, and Greek or French or German; (*e*) is awarded after competitive examination among Cambridge Graduates in Anatomy and Physiology. The more important of the other Scholarships and prizes are as follows:—Four Junior Scholarships—(*f*) No. 1, £30, Anatomy and Physiology; (*g*) No. 2, £20, Anatomy and Physiology; (*h*) No. 3, £25, Chemistry, Physics, and Biology; (*i*) No. 4, £15, Chemistry, Physics, and Biology; (*j*) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (*k*) Kirkes Scholarship, £30 and medal, Clinical Medicine; (*l*) and (*m*) two Brackenbury Scholarships, £30 each, one in Medicine and one in Surgery; (*n*) Sir G. Burrows Prize, 10 guineas, Pathology; (*o*) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; (*p*) Matthews Duncan Medal and Prize, £20, Midwifery and Gynæcology; (*q*) Luther Holden Research Scholarship in Surgery, awarded by election, £105; (*r*) Lawrence Research Scholarship and Gold Medal in Pathology, awarded by election, £115; and (*s*) Baly Scholarship in Clinical Medicine, £105, awarded by examination.

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[1] For Ancillary Metropolitan Medical Schools see p. 393.

Information may be obtained on application to the Dean to the Medical College: Dr. T. W. Shore. The Warden of the Residential College is Mr. R. M. Vick.

CHARING CROSS HOSPITAL.—The Hospital, to which the School is attached, contains 300 beds. Over 3000 cases pass through its wards each year, and some 24,000 out-patients and casualties are treated. There are special departments for Mental Diseases, Midwifery, Diseases of Women, of Children, of the Skin, Ear, Throat, Nose, and Teeth, for Orthopædic Cases, X Ray work, and for Electrical Examination and Treatment.

Appointments.—In the Medical School Demonstratorships and Assistant Demonstratorships are open to students of the School. Medical, Surgical, and Obstetric Registrars to the Hospital are appointed annually. Six House Physicians, six House Surgeons, and two Resident Obstetric Officers are appointed each year after competitive examination.

Primary and Intermediate Studies.—By an agreement with the University of London the School sends its Primary and Intermediate Students to receive their lectures and practical work at King's College, which is situated within four minutes' walk.

Final Studies.—These are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged to cover all the subjects necessary for qualifying examinations. Departments are also available for other final subjects of Materia Medica, Toxicology, and Operative Surgery.

An Institute of Pathology with a whole-time staff of scientific workers and fully equipped Laboratories has been established in the School. Students receive their training in Preventive Medicine, Pathology, and Bacteriology here, and are encouraged to undertake Research. Special facilities are available for Postgraduate Research and Study.

The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital adjoining. Special lectures and demonstrations are arranged for Postgraduates.

The *Museum* contains over 4000 specimens, including a notable collection of over 800 gynæcological specimens, "The Cuthbert Lockyer Collection."

Students' Club.—The social comfort and convenience of students are met by library, reading, and smoking-rooms, refreshment-room, &c. The Club, which is under the control of a Committee of Students, provides needful athletic recreation, and includes the Medical Society. An athletic ground, comprising six acres, has recently been acquired and is now in use.

Women Students.—Women students are admitted to the School and Hospital upon the same terms and conditions as men, and after qualification are eligible for resident Hospital appointments.

Fees.—Now under revision.

Further information may be obtained on application to the Dean, Dr. W. J. Fenton, Medical School, Charing Cross Hospital, London, W.C.

ST. GEORGE'S HOSPITAL.—This hospital has a service of 436 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. One ward is set apart for Diseases Peculiar to Women, and a Maternity Ward of 11 beds has been instituted recently. Children's beds are placed in the women's wards. Two wards are allotted to ophthalmic cases.

Entrance Scholarships and Endowed Prizes of a total value of £600 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the authorities of King's College for students who enter the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at that College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Eight house physicians and eight house surgeons are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £350 per annum each; Medical Registrarship at £200 per annum; Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £50; the post of Resident Anæsthetist at £100; the post (2) of Senior Anæsthetists at £50; the posts (2) of Junior Anæsthetists, each at £30. The St. George's Hospital Club, with smoking- and luncheon-rooms on the hospital premises, and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the Rugby football, lawn tennis, boxing, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Scholarships and Prizes.—At this school two entrance scholarships are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two University Entrance Scholarships, 90 guineas and £70 respectively, Anatomy and Physiology. This year, in addition to these Scholarships, Exhibitions, each of the value of £40 and up to eight in number, will be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (*c*) William Brown Exhibition, tenable for two years and open to perpetual pupils having registrable qualifications, £135 per annum, Practice of Medicine, Midwifery, and Surgery; (*d*) William Brown Exhibition, tenable for three years and open to perpetual pupils qualified not more than three years previously, £49 per annum, Essay and Original Work; (*e*) Allingham Scholarship in Surgery for Students qualified not more than three years, £60, Competitive Essay; (*f*) and (*g*) two Brackenbury Prizes, one in Medicine and one in Surgery, £30 each, open to students of not more than five years' standing; (*h*) H. C. Johnson Memorial Prize, £19, Practical Anatomy; (*i*) Pollock Prize, £23, Physiology, Physiological Chemistry, and Histology; (*j*) Clarke Prize, £5; (*k*) Thompson Medal, £5, Clinical Reports; (*l*) Brodie Prize, £7, Clinical Reports; (*m*) Webb Prize, open to perpetual pupils, £30, Bacteriology; (*n*) Sir Francis Laking Memorial Prize £65, open to students having registrable qualifications.

Further information may be obtained from the Dean of the Medical School, Dr. J. A. Torrens.

GUY'S HOSPITAL.—This hospital, founded by Thomas Guy in 1721 for the reception of 400 patients, and enlarged through the aid of a large bequest from the late William Hunt, contains at the present time 626 beds. The whole of the medical school has been rebuilt during the last 27 years. It provides ample accommodation, with modern equipment, for all the non-clinical subjects of the medical curriculum. Within the grounds of the hospital are situated the residential college, with accommodation for 35 students, the students' club, with reading, smoking, luncheon, and dining-rooms, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 20 minutes from the hospital.

House physicians, house surgeons, out-patient officers and assistant house surgeons, obstetric residents, ophthalmic house surgeons, clinical assistants, clerks to anæsthetists, surgeons' dressers, medical clinical clerks, post-mortem clerks, extern obstetric dressers, and dressers and clerks in the special departments are appointed from among the students upon the recommendation of the Medical Council according to merit. There is a Venereal Clinic, in accordance with the Scheme of the Local Government Board and London County Council. Lectures and clinical instruction are given, to which Medical Students and Practitioners are admitted without fee.

The following new Clinics have been opened: Salomon's Welfare Centre (for Maternity and Children), Tuberculosis Department, and V.D. Department.

Scholarships. — Six entrance scholarships are awarded annually as follows:—(*a*) one War Memorial scholarship, providing a free Medical Education for five years of the value of £200, to be awarded alternately in Arts and Science (next award, July, 1924, Science); (*b*) one Arts scholarship of £100 for students under 21 years of age, Latin, English, Greek, or French or German, Arithmetic, Euclid, and Algebra; (*c*) one Science scholarship for students under 21 years, £100; subjects, any two of the following: Inorganic Chemistry, Physics, and Biology; (*d*) a Junior Science scholarship of the value of £100 is offered for competition, annually in July, to candidates who have attended Preliminary Science Classes at this School; (*e*) two open Science scholarships: (1) a War Memorial scholarship of the value of £80, awarded annually in September; (2) an open scholarship of the value of £80, awarded annually in September, for students under 25 years of age who have completed the curriculum for, or passed the examination in, Anatomy and Physiology for a medical degree in any University of the British Empire, and have not entered as students in any Metropolitan Medical School; subjects, any two of the following: Anatomy, Physiology, Organic Chemistry, Pharmacology, General Pathology.

In agreement with the practice of the Universities, an allowance will be made (1) for Military Service performed by candidates, the term " military service " meaning service in the Naval or Military Forces of His Majesty or of His Majesty's Allies during the war; or (2) in respect of other approved duties in connexion with national defence.

The Dean of the Medical School is Professor T. B. Johnston, from whom further information may be obtained.

UNIVERSITY OF LONDON: KING'S COLLEGE.—The medical department (Faculty of Medical Science) at this College only deals with Preliminary and Intermediate subjects, and instruction in these subjects is given in the College laboratories by university professors and their assistants to students entering the College directly and also to students of the following four hospital schools which prepare only for the final examinations—viz., King's College Hospital, Westminster Hospital, St. George's Hospital, and Charing Cross Hospital. The department is open to both men and women.

Scholarships.—(*a*) Two Warneford Entrance Scholarships of £30 each for four years. Examination in July, subjects selected from Divinity, Classics, Science. (*b*) Sambrooke Scholarship of £25 for two years. Examination in May, subjects selected from Mathematics, Physics, Chemistry, Botany, Zoology, and Geology. (*c*) Worsley Scholarships: £100 in five annual instalments of £20. (*d*) Rabbeth Scholarship of £20 for best work in first year. (*e*) Second Year Scholarship of £20 tenable for one year. (*f*) Daniell Scholarship of £40 for one year. Awarded on results of University Honours Examination.

Fees.—Tuition fee of 35 guineas for the first year, £42 for the second and third years, with a materials fee of 4 guineas in the first year, 6 guineas in the second year, 4 guineas in the third year. For prospectus and further information application should be made to the Dean of the Medical Faculty (Professor E. Barclay-Smith).

Dental Course.—The College, in association with King's College Hospital, have instituted a Dental Diploma Course.

Fees.—First year (Chemistry and Physics), 20 guineas; second and third years (Anatomy, Physiology, Dental Mechanics, and Dental Metallurgy), 52 guineas per annum. Fourth and fifth years (Hospital), 60 guineas per annum. For prospectus and further information application should be made to the Secretary, King's College Hospital Medical School, Denmark Hill, S.E.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—The advanced subjects in the curriculum are taught at the Medical School attached to King's College Hospital, which is situated at Denmark Hill, S.E. 5. The hospital stands in the midst of a South London population, from which an immense amount of clinical material is forthcoming. During the past year there were 198,456 attendances in the out-patient and casualty departments. There are 400 beds available for in-patients, and provision will ultimately be made for 600 beds. There are special departments for Bacteriology, Children, Clinical Pathology, Dermatology, Gynæcology and Obstetrics, Laryngology, Massage, Neurology, Odontology, Ophthalmology, Orthopædics, Otology, Physicotherapy, Psychological Medicine, Radiology, Rhinology, and Urology, each in charge of a specialist and his staff. Clinics are also held in applied pharmacology, cardiology, and medical chemistry. The appointments open to students are those of clinical assistant to the special departments; medical, surgical, obstetric, and pathological tutorships; resident casualty officers; resident anæsthetist; bacteriologist; clinical pathologist; pathological registrar; and medical, surgical, and obstetric registrarships. Fourteen resident medical and surgical officers are appointed half-yearly.

Scholarships and Prizes.—(*a*) Warneford Scholarships, (*b*) Sambrooke Scholarship, (*c*) Rabbeth Scholarship, £20 (see above); (*d*) Medical Entrance Scholarships, £50 (Anatomy and Physiology), and £50 (Pathology and Pharmacology) open to students who (1) propose to take a degree at any British University, and have passed their University examination in Biology, Chemistry, and Physics, and who (2) will become students at King's College Hospital from date of entering upon Scholarship; (*e*) A Medical Entrance Scholarship in Science, value £50, tenable for five years, successful candidates to study at King's College and King's College Hospital; (*f*) Three Medical Scholarships, £40 for fifth-year students, £20 for third-year students, and £20 for second-year students; (*g*) Three Sambrooke Registrarships, open to matriculated students who have filled certain appointments in hospital; (*h*) Carter Prize, £15, Botany; (*i*) Tanner Prize, £10, Obstetrics and Diseases of Women; (*j*) Todd Prize, £4 4*s.* and medal, Clinical Medicine; (*k*) Two Burney Yeo Entrance Scholarships, £80 each, open to students of Oxford and Cambridge on the nomination of the Regius Professors; (*l*) an Epsom College Scholarship, value £50, offered annually to a student of Epsom College who has taken the first part of the courses for Medical Degrees at the Universities of Oxford, Cambridge, or London. The Warneford and Sambrooke Scholars are required to take the subjects of the preliminary and Intermediate examinations at King's College, and the final subjects at King's College Hospital.

Athletics.—The King's College Hospital Clubs and Societies Union was formed in 1908, and consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. Admirable playing fields, over six acres in extent, have been provided for the use of the students on Dog Kennel Hill, Lordship-lane, S.E., about ten minutes' walk from the hospital. There are also Tennis Courts in the grounds of the Hospital and of " The Platanes "—a hall of residence available for students belonging to the hospital.

Fees.—The composition fee for Hospital work and Final subjects of the curriculum is 93 guineas if paid in one sum, or 95 guineas if paid in two instalments, in addition to the Entrance Fee of 10 guineas. The Calendar of the School will be sent on application to either of the following: Dr. H. Willoughby Lyle, *Dean*; Mr. S. C. Ranner, *Secretary of the Medical School*, King's College Hospital, Denmark Hill, S.E. 5.

LONDON HOSPITAL.—The hospital, with its Medical College and Dental School, is situated in the Mile End-road, E. The hospital contains 950 beds, which are in constant use, and is the only general hospital for East London. During last year 17,444 in-patients and 107,455 out-patients received treatment, while 7215 major operations were performed. 32,427 out-patients attended the special departments for diseases of the Eye, Ear, Nose and Throat, Skin, Teeth, &c., and the Orthopædic, Venereal, Radiological, Electro- and Physico-Therapeutical and Inoculation Departments. The hospital presents, therefore, a large field for clinical instruction, and in its Wards and Out-patient Departments exceptional opportunities are afforded for acquiring an extensive and practical experience in all phases of disease.

The Clinical Units in Medicine and Surgery coördinate the teaching of their subjects in the Hospital. The directors and their assistants give practical instruction in Elementary Clinical Medicine and Surgery to all students before they are allowed to enter the Wards and Out-Patient Department. Senior Students are encouraged to work with the units. Special courses of lectures and demonstrations are arranged in Medicine and Surgery and their ancillary subjects. Opportunities for research will be provided under the supervision of the staffs of the units.

Owing to the large number of patients more appointments are open to students before and after qualification than at any other hospital. Holders of resident appointments have free board. Special classes are held for the examinations of the University of London, for the Fellowship of the Royal College of Surgeons, for the Membership of the Royal College of Physicians, and for other higher examinations. A course of post-graduate training is held in the work of School Clinics for School Medical Officers (actual and intending) and others. Special entries for medical and surgical practice can be made. A residential Hostel on hospital grounds is provided for the convenience of students. The Clubs Union Athletic Ground of over 13 acres is within easy reach of the hospital.

Scholarships and Prizes.—At this school the successful candidates for the first items in the list here shown must enter for the course subsequent to passing the examination in Biology, Chemistry, and Physics. The value and the subjects of examination are as follows:—Price Scholarship £100, and one Entrance Scholarship of £50, subjects of First Medical Examination at the University of London; Epsom College Scholarship, free education, subjects of First Medical Examination as above; Price Scholarship, open to students of Oxford and Cambridge Universities, £52 10*s*., Human Anatomy and Physiology; Buxton Prize, £31 10*s*., subjects of Anatomy and Physiology; three Prizes for Clinical Work, £20 each, Medicine, Surgery, and Obstetrics and Gynæcology; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine, and Surgery; Letheby Prizes (2), £25, Chemistry and Chemical Pathology; eight Dressers' Prizes, amounting to £40, zeal, efficiency, and knowledge of Elementary Clinical and Minor Surgery; Hutchinson Prize, triennial, £40, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 respectively; Andrew Clark Prize, biennial, £26, Clinical Medicine and Pathology; James Anderson Prizes (4), £20, Elementary Clinical Medicine; Arnold Thompson Prize, £15, Medical and Surgical Diseases of Children; and Liddle Prize, triennial, £120.

Medical Research Funds.—Research Funds of over £26,000, including the Eliza Ann Alston Endowment Fund for Medical Research, provide valuable scholarships for men wishing to undertake research or desirous of preparing Theses for University degrees.

Dean: Professor William Wright, London Hospital Medical College, E.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—The Hospital and Medical School are situated close to Paddington station (G.W.R.) having on one side a poor district of 500,000 persons, and on the other side the residential district of Kensington and Bayswater. The hospital contains 305 beds and, by a scheme of affiliation, for teaching purposes, of the Paddington Infirmary, Paddington Green Children's Hospital, and Maida Vale Hospital for Nervous Diseases, the teaching facilities extend over 1000 beds. The Athletic ground (10 acres) is situated at Wembley and can be reached in 30 minutes by a constant service of trains. A large pavilion has recently been added.

Clinical Facilities.—Clinical Units in Medicine and Surgery were established in 1920, and have now been formally recognised by the University Grants Committee. St. Mary's being one of the six Medical Schools in London which enjoy this privilege. Lying-in beds have recently been added, and, in addition to this, arrangements have been made by which all students take out a short course of instruction in Practical Midwifery at Queen Charlotte's Hospital without additional fee.

Institute of Pathology and Research.—Students specially interested in Pathology and Bacteriology have singular advantages at St. Mary's. The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright, F.R.S.

Appointments.—Three Research Scholarships of £200 each are awarded annually to students working in the departments of the institute; and preparation is being made to open 13 research beds. Clerkships in Pathology, Bacteriology, and Chemical Pathology, lasting for a period of three months, are open to students of the fifth year, and enable them to carry out the Pathological and Bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually.

Complete Curriculum.—The Medical School provides complete courses of instruction, and students can join at once on passing a Preliminary Examination in Arts. Terms begin in October, January, and April.

Entrance Scholarships.—Three Entrance Scholarships of the value of £210 each are awarded annually.

Fees.—Composition Fee for entire curriculum (5½ years) £200 in one sum, or £210 by four annual instalments. Composition Fee for Clinical curriculum (2½ years) 90 guineas in one sum, or 95 guineas by two annual instalments. As an alternative, students may pay an annual fee of 40 guineas with an entrance fee of 10 guineas.

MIDDLESEX HOSPITAL.—The hospital contains over 450 beds, with special wards for Cancer, Maternity and Gynæcological and Ophthalmological cases, and for Diseases of Children. Other special departments include those for Diseases of the Eye, Ear, Nose and Throat, and Skin; Nervous diseases, Orthopædic cases, Diseases of the Rectum and Venereal Diseases. There is also an Electro-Therapeutic department. The Cancer Charity, containing 92 beds and Special Investigation Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects. In the Electro-Therapeutic Department, students obtain instruction in the Treatment of Lupus and Cancer by the X ray method of treatment.

The Medical School, which now includes the Bland-Sutton Institute of Pathology and the Cancer Research Laboratories is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, and for the Diplomas in Public Health, for which two courses are held yearly, commencing in April and October. Ample laboratory and class-room accommodation is provided. The teaching staff includes 6 Professors, 29 recognised Teachers, 8 Demonstrators, 4 tutors. The Bland-Sutton Institute of Pathology is completely equipped for routine hospital investigations, teaching and research work, and contains a new lecture theatre and large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility for study.

Other features of interest are: the institution of a course in Medical Radiology and Electrology, under the direction of the "Joel" Professor of Physics; D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone. Primary F.R.C.S. class will resume in August.

Special classes are held to prepare students for the Intermediate Examinations of the Universities.

Hospital Appointments.—All appointments are made without fee of any kind, and the following are appointed at intervals annually: six house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, one resident anæsthetist, and two resident officers to the special departments. The medical and surgical casualty officers are appointed twice a year. The medical, surgical, and obstetric and gynæcological registrars are appointed as vacancies arise. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department. Eight Registrars are appointed annually.

Scholarships, Prizes, &c.—(*a*), (*b*), and (*c*). Three Entrance Scholarships, value £100, £50, and £25, and (*d*) a University Scholarship, value £50, are awarded annually in September. The successful candidates are required to become general students of the school. (*e*) A Freer Lucas Scholarship for Foundationers or Council Exhibitioners of Epsom College is awarded annually on the nomination of the Headmaster. There are also, (*f*) and (*g*), two Broderip Scholarships, value £60 and £40 respectively; (*h*) the Lyell Gold Medal and Scholarship, value £55 5*s.*; (*i*) the John Murray Medal and Scholarship, value £25 (awarded every third year); (*k*) the Freeman Scholarship, value £30; (*l*) the Hetley Clinical Prize, value £25; (*m*) the Leopold Hudson Prize, value 11 guineas; and (*n*) the Second Year's Exhibition, value 10 guineas. There are also numerous class prize examinations.

Fees.—The fees are arranged on a basis of an annual payment of approximately £42 for the five years of the curriculum. After five years, if the student is not qualified, the annual fee is £21.

The Amalgamated Students' Club includes the following: the Medical Society, the Common Room Society, Musical Society, the cricket club, the football clubs, the athletic club, the rowing club, the musical society, the chess club, the lawn tennis club, and the hockey club. There are a restaurant and gymnasium in the school buildings, and large athletic grounds at Wembley, with new pavilion. A subscription to the Amalgamated Students' Club is payable by all General and Dental students. Full particulars on application to the Dean, Middlesex Hospital Medical School, W. 1.

St. Thomas's Hospital.—This Hospital received its present charter from King Edward VI., but as a monastic institution was in existence prior to the year 1207. The building occupies a unique position by the river, opposite the Houses of Parliament, and contains 632 beds. The in-patients last year numbered 8639, whilst the number of attendances as out-patients, including the casualty and light departments, was 466,951. There are special departments for the treatment of women, children, the eye, ear, nose and throat, skin, teeth, and for orthopædics. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction. The Venereal Department has been established as part of the London County Council scheme. Departments for light treatment, X rays, and the Physico-therapeutics are also special features. A speech clinic has been inaugurated in connexion with the Children's Department. Exceptional facilities are offered in the hospital laboratories for the study of General Pathology, Clinical Pathology, Chemical Pathology, and of Treatment by Serums and Vaccines. Surgical operations take place in the main theatres every day, except Saturdays, at 2 P.M. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week. Clinical lectures are delivered every Wednesday during the sessions. All appointments in the hospital are open to students without extra fee. Appointments open to students before qualification: Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third years' work. Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity ward thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anæsthetics by the hospital anæsthetists. The Students' Club comprises a spacious restaurant and smoking and reading room. There is no occasion for students to leave the hospital buildings during working hours. The curriculum is arranged to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of London and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Appointments Open to Students after Qualification.—A Resident Assistant Physician, a Resident Assistant Surgeon, and a Resident Anæsthetist are appointed annually at a salary of £200 each per annum. Two Hospital Registrars, Medical and Surgical, at an annual salary of £250 each are appointed yearly. The tenure of these offices may be renewed for a term not exceeding two years. An Obstetric Tutor and Registrar, an Ophthalmic Registrar (at an annual salary of £50 each), and an Orthopædic Registrar (unpaid) are appointed yearly. Ten Resident Casualty Officers and Anæsthetists (including two Senior) are appointed every six months. Seven House Physicians (including two Obstetric House Physicians, and one House Physician to the Department of Diseases of Children), nine House Surgeons (including two Ophthalmic House Surgeons, one Orthopædic House Surgeon, and two House Surgeons to the Ear, Nose and Throat Department) are appointed every six months. Eight Clinical Assistants in the Special Departments are appointed every three months, and hold office for six months if recommended for re-election. There are three Assistants in the Department of Pathology; the Senior receives £600 a year, and the two Juniors £450 each.

Fees.—The annual fees are: For each year of study £50. These fees cover all tutorial classes, but do not include instruction in infectious fevers, pharmacy, and vaccination. Qualified practitioners are permitted to attend the hospital practice on terms which may be ascertained from the Medical Secretary.

Scholarships and Prizes.—At this school there are five Entrance Scholarships—namely, two in Arts, equivalent to the tuition fees for the first year of study; two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in any two of the following subjects: Anatomy, Physiology, and Chemistry. The value of all entrance scholarships must be taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (*a*) William Tite Scholarship for second-year students, £25; (*b*) and (*c*) Musgrove Scholarship or (alternately) Peacock Scholarship, each for third-year students and tenable for two years, £35 each; (*d*) Cheselden Medal, Surgery and Anatomy; (*c*) Mead Medal, Medicine, Pathology, and Hygiene; (*f*) Toller Prize, Medicine, Pathology, and Hygiene; (*g*) Bristowe Medal, Pathology, and Morbid Anatomy; (*h*) Solly Medal and Prize, biennially, Surgical Reports; (*i*) Cutton Memorial Medal in Clinical Surgery, biennial; (j) Wainwright Prize, Medicine, Pathology, and Hygiene; (k) Hadden Prize, Pathology; (l) Beaney Scholarship, £50 biennially, Surgery and Surgical Pathology; (m) Sutton Sams Prize, biennially, reports of cases in Obstetric Medicine; (n) Grainger Testimonial Prize, £31 10*s*. Anatomy and Physiology; (o) Louis Jenner Research Scholarship, tenable for two years, £60 annually, Pathology; and (p) Research Scholarship, tenable for two years, £200 per annum.

The Dean of the Medical School is Sir Cuthbert S. Wallace, and the Medical Secretary Dr. A. Elliot, from whom any further information may be obtained.

UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.—University College has been constituted a University centre for the teaching of medical sciences. The College Faculty of Medical Sciences comprises the Departments of Physics, Chemistry, Botany, and Zoology (the Preliminary Medical Sciences); also the Departments of Anatomy, Physiology and Pharmacology (the Intermediate Medical Sciences), and the Department of Hygiene and Public Health. Research work is undertaken in all departments. The completion of the Institute of Medical Sciences, which the generosity of the Rockefeller Foundation made possible, provides exceptional facilities for research and post-graduate study in anatomy, physiology and pharmacology. In particular might be specified the opportunities for investigation in human and comparative embryology and neurology, in histology, radiology, anthropology, biochemistry, and experimental physiology and experimental embryology. Arrangements have also been made for the closer correlation of work in the Institute with that of University College Hospital and its Medical School.

Faculty of Medical Sciences.—Composition Fees.—For the courses required by the University of London. 1. For the First Medical Course, 35 guineas, entitling to one attendance and to the privileges of the Union Society for one session. 2. For the Second Medical (Intermediate) Course 80 guineas, payable in two instalments of 40 guineas each. This fee entitles to attendance at Anatomy and Physiology during three years and to one attendance at Organic and Applied Chemistry, Pharmacology, and Materia Medica, and to the privileges of the Union Society or the Women's Union Society for two sessions.

For the medical education required by the Examining Board in England and the Society of Apothecaries. First examination, Parts I., II., III., 29 guineas, entitling to attendance for the First and Second Terms and to the privileges of the Union Society for one session; 35 guineas, entitling to attendance throughout the session and to the privileges of the Union Society for one session. First Examination, Part IV., and second examination, 80 guineas, payable in two instalments of 40 guineas each. This fee entitles to attendance during three years in all subjects but Practical Pharmacy and to the privileges of the Union Society for two sessions.

Scholarships and Prizes.—The first three items on the present list require a complete intermediate course at University College. The money value and subjects at examinations are as follows: (*a*) The Bucknill Scholarship, 135 guineas; (*b*) and (*c*) two Entrance Exhibitions, 55 guineas each, Chemistry, Physics, Botany, and Zoology; (*d*) Cluff Memorial Prize, £15 biennially, Anatomy, Physiology, and Chemistry; (*e*) Schafer Prize in Physiology, £18 triennially; (*f*) Sharpey Physiological Scholarship, £105, Biological Sciences; (*g*) Morris Bursary for sons of deceased professional men, by nomination, tenable for two years, £16 a year; and (*h*) five Gold and five Silver Medals awarded annually in various departments.

Women students are admitted.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—Dean: Sir George Blacker. Vice-Dean: Mr. Gwynne Williams. Secretary: Mr. G. E. Adams. Open to men and a limited number of women students. Fees for Preliminary and Intermediate Course: See under University College. For the Final M.B., B.S. (London) Course, 112 guineas if paid in one sum, 115 guineas if paid in two instalments, as follows—first year, 70 guineas; second year, 45 guineas. This fee entitles to attendance on lectures and hospital Practice during three years and to one attendance on Practical Pathology and Practical Surgery. Vaccination and attendance at a Fever Hospital are not included. This course of instruction is also suitable for the corresponding examinations at the Universities of Oxford, Cambridge, Durham, and other British Universities, and for the medical education required by the Examining Board in England and the Society of Apothecaries. There are over 300 beds in the hospital.

Clinical Units in Medicine and Surgery are now in operation. The whole-time Directors of the Units are concerned with the organisation of the teaching generally, but the honorary staff are responsible for the largest share of the teaching in the wards and Out-patient Department of the hospital. A Unit in Obstetric Medicine will be established as soon as the new Obstetric Hospital now in course of construction is finished.

The new buildings of the Obstetric Hospital of 60 beds (rendered possible by the Rockefeller Benefaction), the new Residents' House (with accommodation for 30 residents and students), the extension to the Nurses' Home, and the new research laboratories for the Medical School, are well under way, and these buildings should be ready for occupation by the spring of 1924.

Special Departments, Clinical and Laboratory Facilities.—Those who are desirous of carrying out original research in Pathology, including Morbid Anatomy, Bacteriology, Experimental Pathology, and Chemical Pathology, are admitted to work in the laboratories of the school by the Professor of Pathology, and under certain conditions can receive grants from the Charles Graham Medical Research Fund. A special course of instruction is given in conjunction with University College for preparation for the examinations for Diplomas in Public Health of the various universities and examining bodies. In the Dental School in Great Portland-street, formerly known as the National Dental Hospital, there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

Appointments tenable by Students.—Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Twelve house physicians, eight house surgeons, four senior and four junior obstetric assistants (of the total number of resident officers not more than three may be held by women students at any one time) are selected annually by examination from among the senior students who have a medical qualification. The house physicians and house surgeons reside free in the hospital for six months, and the senior obstetric assistants for three months. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: Resident Medical Officer, Surgical Registrar, Obstetric Registrar, Harker-Smith Cancer Registrar, Casualty Medical Officer and a Casualty Surgical Officer, Assistants in Ear and Throat, Ophthalmic, Skin and Venereal Diseases Departments, and House Anæsthetist.

Museum of Pathological Anatomy.—The Museum is open for study from 9 A.M. to 5 P.M. Microscopic sections of most of the specimens in the Museum have been prepared and are available for the use of students on application to the Curator. The Museum contains 1100 admirable paintings by Sir Robert Carswell and Sir Charles Bell and a collection of old surgical instruments formerly belonging to Robert Liston.

The Anatomical Museum of the University of London, University College, is open to all students of

University College Hospital and Medical School on the recommendation of the School Committee.

The Medical Library is open daily for the purposes of study to every student of the Medical School from 9 A.M. to 5 P.M., Saturdays 9 A.M. to 1 P.M. It contains about 13,500 works on medical subjects, including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the Medical School are required to become members. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet court in the Medical School. The Athletic Ground, which is used in conjunction with the Union Society of the University of London University College, is situated near the G.W.R. station at Perivale.

Scholarships and Prizes.—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(*a*) Entrance Scholarship, Bucknill, 135 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Exhibitions, 112 guineas each, Anatomy and Physiology; (*e*) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (*f*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*g*) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (*h*) Magrath Clinical Scholarship, about £100, Clinical Cases; (*i*) Percival Alleyn Scholarship, about £60, Surgery; (*j*) Filliter Exhibition, £30, Pathology; (*k*) Erichsen Prize, £10 10*s*., Practical Surgery; (*l*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*m*) two Liston Gold Medals for Clinical Surgery; (*n*) Alexander Bruce Gold Medal for Pathology and Surgery; and (*o*) Tuke Silver and Bronze Medals for Pathology. (*p*) Radcliffe Crocker Travelling Scholarship for Dermatology. (*q*) Leslie Pearce Gould Travelling Scholarship for Surgery.

Residence of Students.—University College Hall, Ealing, is recognised by the Medical School authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge. Gentlemen who desire assistance in their studies should consult the Dean or Lecturers.

WESTMINSTER HOSPITAL.—The hospital contains 225 beds and affords relief to upwards of 1600 in-patients and 25,000 out-patients annually. There are separate departments for Diseases of the Eye, Skin, Teeth, Ear, Nose, and Throat, for Orthopædic practice, for Diseases of Women, for Diseases of Children, for Radiography, for Venereal Diseases, and for Massage, Electrical and Light Treatment. The Anatomical, Pathological, and Materia Medica Museums are open to all students of the school.

The usual registrarships and house appointments are open to male and female students.

By a scheme for the concentration of the teaching of the preliminary and intermediate subjects of the curriculum, which has the support of the London University, an arrangement has been made by the Westminster School for the teaching of these subjects at King's College. Students, however, may join the Westminster Medical School as formerly and may compete for Entrance Scholarships as heretofore.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £70 each. Summer Session: Two Scholarships in Anatomy and Physiology, £70 each. A certain number of Scholarships have been allotted to Universities of England, Wales, and the Colonies, and to Public Schools. These Scholarships are awarded entirely on the nomination of the principal of the university or school. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Notes of Cases; Clinical Surgery Prize, £5, Notes of Cases; Chadwick Prize, £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology, 5 guineas, a Paper and Tests in Practical Work; Alfred Hughes Memorial Prize, open to Second-year students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students—Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second-year Scholarship £20, Elementary Anatomy, Physiology, Histology, and Organic Chemistry; Daniell Scholarship, tenable for two years, £20, Chemistry; Rabbeth Scholarship, open to First-year Students, £20; Class Examinations in the Preliminary Scientific Course; and the Sambrooke King's College Scholarship in Science, value £25. Inquiries and requests for Prospectus may be addressed to the Dean, Dr. A. S. Woodwark.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN, 8, Hunter-street, Brunswick-square, W.C.—The fee for the medical course for the degrees of the University of London and for the diplomas of the Royal Colleges of England and for other qualifications is £240 in five instalments. This sum includes library and laboratory fees. Arrangements are made for pre-medical courses in Chemistry and Physics, which are included in these fees.

The Royal Free Hospital contains 240 beds. The Hospital also has large Casualty and Out-patient Departments, and Departments for Special Diseases. A new and specially equipped block contains the Obstetrical and Gynæcological Unit which, with the Marlborough Maternity Department, controls 68 beds. A Maternity District is attached to the Unit. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital for Paralysed and Epileptic, South London Hospital, and Royal London Ophthalmic Hospital.

An agreement has been made under which a certain number of students of the school may attend full clinical courses at St. Mary's Hospital, Paddington (305 beds).

Courses are arranged for the Primary Fellowship Examination of the College of Surgeons; also for dental students in conjunction with the Royal London Dental Hospital, Leicester-square.

Students after qualification can hold the posts of house physicians, house surgeons, obstetric assistants, clinical assistants, assistant anæsthetist, medical, gynæcological, and surgical registrars, and assistant pathologist; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics. Many other resident posts in London and elsewhere are also open to them.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments.

There are residential chambers at 8, Hunter-street, 25, Gordon-square, 16, Brunswick-square, 5, Mecklenburgh-square, and 36, Tavistock-square, and the Warden can be consulted on the subject of other residences for students. The Students' Union arranges the social, athletic, and other clubs and societies.

Scholarships and Prizes.—(*a*) Isabel Thorne Scholarship, £30. (*b*) St. Dunstan's Medical Exhibition, £60 a year, tenable for three or five years. (*c*) Mrs. George M. Smith Scholarship, £50 a year, tenable for three or five years and next to be awarded in 1925. (*d*) Bostock Scholarship, tenable for two or four years, and next to be awarded in June, 1927, £90. (*e*) Mabel Sharman-Crawford Scholarship, tenable for four years, £20 a year. (*f*) Sir Owen Roberts Scholarship, £75 a year for four years. (*g*) Mabel Webb Research Scholarship, tenable for one year and renewable, £30, Physiology, Chemistry, or Pathology. (*h*) Fanny Butler Scholarship, tenable for four years; next award in July, 1926, £14 10*s*. (*i*) John Byron Bursary, tenable from two to four years, for students already in the School requiring assistance for the prosecution of their medical studies, application to the Secretary by March 31st; next award in March, 1924, £20. (*k*) Helen Prideaux Prize, awarded every second year to a student who has become qualified during the two years immediately preceding the award, and to be spent in assisting the holder to further study, £40. (*l*) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, awarded annually in June. It is open to all medical women, preferably coming from India, or going to work in India, for assistance in Post-graduate study. (*m*) Sarah Holborn Scholarship, vale £20 a year for three or five years, awarded every alternate year; next award in 1925. (*n*) Dr. Margaret Todd Scholarship, tenable for four years, £37 10*s*. a year, awarded in alternate years; next award in July, 1925. (*o*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July, 1924. The Dorothy Chick Gift, £20, is awarded annually for efficiency in Practical Midwifery. Two Richardson-Kuhlmann Prizes are given each year, value £12, for proficiency in Clinical Obstetrics, value £8, for proficiency in senior subjects respectively. Two Evans Prizes of £2 2*s*. and £1 1*s*. are given each year on the results of the class examination in Midwifery. The Evans Prize for Operative Midwifery, value £5 5*s*., is awarded yearly. The Edith Pechey Phipson Prize in Pharmacology, value £3 3*s*., is awarded annually. There is also a small loan fund from which assistance can occasionally be given to students and to graduates who specially require pecuniary help. Prizes and Certificates of Honour are awarded in each class at the end of the session.

The Dean of the Medical School is Miss Aldrich-Blake, M.D., M.S.; the Honorary Secretary, Dr. May Thorne; and the Warden and Secretary, Miss L. M. Brooks, to whom inquiries may be addressed.

UNIVERSITY OF DURHAM.

Two Diplomas, one Licence, and seven degrees are conferred—viz., the Diploma in Public Health, Diploma in Psychiatry, the Licence in Dental Surgery, and the degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, and Doctor of Hygiene.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Anatomy, Elementary Biology, Chemistry, and Physics. The subjects of the Second Examination are—Anatomy and Physiology. The subjects for the Third Examination are—Materia Medica and Pharmacy, Pharmacology, Medical Jurisprudence, Public Health, and Pathology and Elementary Bacteriology. The subjects of the Fourth Examination are—Medicine, Clinical Medicine and Psychological Medicine, Surgery and Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Therapeutics, and Diseases of the Skin, of the Throat, Nose, and Ear, and of Children. It is required that at least one of the five years of professional education shall be spent in attendance at the University College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of Bachelor of Medicine and Surgery of the University of Durham and must have been engaged for at least two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special examination in the Theory and Practice of Medicine. The subjects of examination for the M.S. are:—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham has instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates shall not be under 40 years of age and shall have been in active practice for 15 years as registered medical practitioners. They shall produce certificates of moral character from three registered members of the medical profession. The fee will be 50 guineas, of which 20 guineas will be retained if the candidate fails to satisfy the examiners.

Doctor of Surgery.—The University of Durham grants the Degree of Doctor of Surgery. Candidates for this degree must be registered medical practitioners, and not less than 24 years of age. They must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery and ancillary subjects. One at least of the three years must be spent in the University. The candidate must submit to the Professor of Surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad. The fee for the examination is £20, and the fee for the degree is £10.

Candidates for any of the above degrees, diplomas, or licence, must give at least 28 days' notice to Professor Howden, Registrar, College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before the 1st of April.

Scholarships and Prizes.—In connexion with this University the following Scholarships and prizes are awarded:—(*a*), (*b*), (*c*), and (*d*). Four Scholarships of £25 a year each, tenable for four years; the examination will be the September Matriculation Examination. Candidates must take English, Latin, Arithmetic, Euclid, Algebra, Geography, English History, and one, or two, of the three languages—French, Greek, German. (See College Calendar for special books.) Open to candidates desirous of being admitted as Medical Students. The successful candidates must take out their entire curriculum at the University of Durham College of Medicine, Newcastle-upon-Tyne. (*e*) Pears Scholarship of £50 a year (when vacant), tenable for three years; Matriculation *Examination.*—At the College of Medicine are: (*f*) Dickinson Scholarship, interest on £400 and gold medal; examination in Medicine, Surgery, Midwifery, and Pathology. Open to full students of the College of Medicine who have passed the third M.B. Examination. (*g*) Tulloch Scholarship, interest on £400; examination in Elementary Anatomy, Biology, Chemistry, and Physics. (*h*) Charlton Memorial Scholarship, interest on £700; examination in Medicine. Open to full students of the College entered for the class on the Principles and Practice of Medicine. (*i*) Gibb Scholarship, interest on £500; awarded annually as a Scholarship in Pathology to full student who passes the best examination in that subject. No student is eligible after completion of his curriculum. (*j*) Luke Armstrong Memorial Scholarship, interest on £680: Original Essay in Comparative Pathology. Open to all Graduates in Medicine or Hygiene and candidates for these degrees who have spent six months at the University and whose age does not exceed 30 years. (*k*) Stephen Scott Scholarship, interest on £1000; Original Essay on any Surgical subject. Open to any graduate in Medicine or Surgery of the University or any student of the College of Medicine. Student's age must not exceed 30 years. (*l*) Heath Scholarship in Surgery, of the value of £200, awarded every second year. All Graduates in Medicine or Surgery of the University are eligible. (*m*) Philipson Scholarships (2). The interest on £1800 to the candidates who obtain the highest marks in the Final M.B., B.S. Examinations held in March and June respectively. (*n*) Gibson Prize, interest on £250 stock; examination in subject of Midwifery and Diseases of Women and Children. Open to students who have attended one course of lectures on Midwifery and Gynæcology. (*o*) Outterson-Wood Prize, interest on £250, in Psychological Medicine. (*p*) Turnbull Prize and Medal; examination in Surface Anatomy. Open to students at end of their second winter session.—At the Royal Infirmary is (*q*) Goyder Memorial Scholarship, interest on £325, awarded annually to student who most distinguishes himself in Clinical Medicine and Clinical Surgery at the Royal Infirmary. For further information apply to Professor R. Howden, Registrar of the College.

The College of Medicine, Newcastle-upon-Tyne.—Clinical instruction is given at the Royal Victoria Infirmary, containing about 550 beds. In it adequate accommodation is provided for the study of the various special subjects, in addition to the ordinary clinical work. Post-graduate classes are held.

The Bacteriological Laboratory.—A new Bacteriological Laboratory has recently been erected adjacent to Armstrong College.

Newcastle-upon-Tyne Royal Victoria Infirmary.—The Infirmary was founded in 1751, but has been entirely rebuilt, the new hospital being opened by His late Majesty King Edward VII. in 1906. The number of beds is 550. The number of in-patients annually is 11,500 and out-patients' attendances 276,000. The medical students of the University of Durham attend the practice of this hospital. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are held by the Assistant Physicians and Assistant Surgeons, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic, Throat, Nose, and Ear, Skin, Gynæcological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory, in which all clinical bacteriological investigations are carried out—opsonic indices estimated with a view to treatment by vaccines and serums, &c. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session of 1923 opens on Oct. 2nd and the summer session of 1924 on April 15th. Applications for detailed information should be made to the Dean, Dr. Horsley Drummond, at the hospital.

There are other institutions in addition to the Royal Victoria Infirmary at which the student of medicine of the University of Durham can receive clinical instruction. Practical Midwifery can be studied at the Newcastle Lying-in Hospital. Instruction is given in Psychological Medicine at the City of Newcastle Mental Hospital. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health. Ophthalmology is further taught at the Northumberland, Durham, and Newcastle Infirmary for Diseases of the Eye.

Post-Graduate Courses.—General and Special Post-Graduate courses are held under the joint auspices of the Council and the College of Medicine, the honorary staff of the Royal Victoria Infirmary, and the British Medical Association.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees extends over five years from the date of commencement of professional study. As a rule the first four of these years must be spent in the University, but the Senate has power of recognising attendance at another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Chemistry, Physics, and Elementary Biology. In the case of such students at least three years must be spent in attendance upon classes at the University. The fifth year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof, and a recognised Pre-Medical Examination in Chemistry and Physics. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. First Examination.—Part I., Elementary Biology and Organic Chemistry.—Part II., Anatomy and Physiology. Second Examination.—General Pathology and Bacteriology, Materia Medica, and Practical Pharmacy. Third Examination (at the end of the fourth year).—Forensic Medicine, Toxicology, Public Health, Therapeutics, and Special Pathology. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery, Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital one month, and mental hospital three months. Vaccination instruction must be taken out and courses of Ophthalmology, Venereal Diseases, Skin Diseases, and Diseases of Ear, Nose, and Throat, Medical and Surgical Anatomy, and Operative Surgery.

Degrees of Doctor of Medicine and Master of Surgery.—At the end of one year from the date of having passed the final M.B., Ch.B. examination the candidate will be eligible to present himself for the higher degrees of either Doctor of Medicine or Master of Surgery or both. Candidates have to present a thesis on some subject embraced in the medical curriculum, and pass a general examination in Principles and Practice of Medicine for the M.D., and one in Principles and Practice of Surgery, including operations on the cadaver, for the M.Ch. A thesis of exceptional merit may exempt from any part of these examinations.

Degree of Ph.D.—The Degree of Doctor of Philosophy is conferred upon candidates who possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and who have been engaged, to the satisfaction of the Medical Faculty, in advanced study and research for a period of not less than two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. After the first year of the course candidates may carry on research elsewhere, under approved conditions, and on completing the course present an original thesis on the subject and to submit themselves for oral and possibly written examination.

Fees.—Matriculation, £2; First Examination, Part I., £2 10*s.*; First Examination, Part II., £2 10*s.*; Second Examination, £2 10*s.*; Third Examination, £2 10*s.*; Final Examination, £10; M.D. or Ch.M., £12 10*s.*

At the University of Birmingham the following Scholarships are awarded:—(*a*) Myers Travelling Studentship of £300, tenable for one year, offered in alternate years, awarded by vote of committee to M.B., Ch.B. Birm. candidates, tenable at some University or Hospital in Great Britain or Ireland, or abroad. (*b*) two Ingleby Scholarships of £10 each, awarded to the candidate at Final Examination obtaining highest "first-class" marks in the subjects of Midwifery and Diseases of Women; (*c*) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (*d*) Sands Cox Scholarship of £21 per annum during two years, awarded to the candidate, not being more than 19 years of age, taking the highest marks at the Higher School Certificate Examination of the Joint Matriculation Board; (*e*) Dental Scholarship of £37 10*s.*, Open Competitive Examination in subjects learned during apprenticeship; (*f*), (*g*), (*h*), and (*i*) Four Queen's Scholarships of £10 10*s.* each. In the Second and Fourth Examinations the Scholarship is awarded respectively to the student taking the first place and obtaining "first-class" marks. In the Third Examination the Scholarship is awarded to the student obtaining the highest "first-class" marks in Pathology and Bacteriology, provided that such student passes at the same examination in the subjects of Materia Medica and Practical Pharmacy. In the Final Examination the Scholarship is awarded to the candidate taking the first place in the examination—that is, obtaining the greatest aggregate number of marks—provided that in each of the subjects of Medicine, Surgery, and Midwifery he gains not less than 60 per cent. of the total available marks; (*j*) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (*k*) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases. The "Arthur Foxwell Memorial Medal" (Gold Medal) is awarded annually to the candidate passing the Final M.B., *Ch.B.* in June, who obtains the highest marks in Clinical Medicine, provided the marks so gained be not less than 60 per cent. The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in the fourth and fifth years (open to all students).

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital and the Queen's Hospital under the direction of the University Clinical Board. The hospitals possess more than 600 beds, treating annually about 9000 in-patients and 70,000 out-patients. The curriculum is adapted in the first place to the University of Birmingham, but it also meets the requirements of the examinations of other licensing bodies. At the General Hospital there are open to the students the following appointments: A surgical registrar, £200 per annum; a resident medical officer, elected annually (£155); a resident surgical officer, elected annually and eligible for re-election for three years (£180); a resident pathologist, elected for six months (£100); three house physicians and four house surgeons hold office for six months, receiving board, residence, and salaries at the rate of £70 a year; two house surgeons to the gynæcological, ophthalmic, and aural departments are elected every six months, receiving board, residence, and a salary of £70 a year; two assistant house surgeons are elected every three months, receiving board, residence, and salaries at the rate of £40 a year, and a resident medical assistant at this hospital, who is not necessarily qualified, is provided with board and residence, and holds office for three months. At the Queen's Hospital there are open to the student the following appointments: Three house physicians, three house surgeons, and one obstetric and ophthalmic house surgeon, who hold office for six months and have salaries at the rate of £70 a year. One casualty house surgeon who holds office for three months at salary at rate of £70 a year. Four non-resident obstetric students who hold office for one month and receive board only on payment of one guinea per week. Thirty-eight other appointments of varying value are at the City Workhouse and Workhouse Infirmary, at the Birmingham General and Branch Dispensaries, at the Birmingham Mental Hospitals, at the City Fever Hospitals, at the Children's Hospital, at the Birmingham and Midland Eye Hospital, at the Orthopædic and Spinal Hospital, at the Maternity Hospital, and at the Ear and Throat Hospital.

Post-graduate Courses.—A Lectureship in Morbid Psychology was established in 1919 in the University, and courses of lectures are given annually by specialists in the subject. The Ingleby Lectures on some subject in connexion with Diseases of Women and Children are given annually by specially appointed lecturers. Post-graduate Courses of Clinical Demonstrations (for General Practitioners) at the Birmingham General and Queen's Hospitals were held from April to June, 1923. Further courses will be arranged later.

BIRMINGHAM GENERAL HOSPITAL.—371 beds are in daily use, 6000 in-patients per annum. Special wards for Children, Gynæcological, Ear and Throat, Venereal, Maternity, Septic and Infectious cases; special beds for Eye and Skin cases. About 50,000 out-patients per annum. Laboratories for Bacteriology and Morbid Histology. Separate rooms adjoin the medical and surgical wards for clinical pathology. Five operating theatres (one for out-patients), all designed and fitted on modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments which include those for Radium, Electro-therapy, Extern Midwifery, and Venereal Diseases. Post-graduate classes are held in every branch of medicine and surgery. The Jaffray Branch Hospital contains 56 beds.

QUEEN'S HOSPITAL (Beds 224).—Similar arrangements for clinical teaching are made here, and the material also is excellent. Ward and tutorial classes and post-graduate courses are regularly conducted by the staff, there are daily clinics in the out-patient department, while teaching duties are definitely assigned to the house physicians and house surgeons. There are also special departments for gynæcology and ophthalmology, dentistry, radiography, pathology, bacteriology, massage, electricity, whirlpool baths, electro-cardiograph, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, Birmingham.—This hospital possesses 120 beds, and there is an average daily attendance of out-patients of 250. Students attending for a period of three months will be granted certificates which will qualify for the University and Conjoint Board examinations. Post-graduate courses are available on various subjects when a sufficient number of graduates are present. A limited number of Non-Resident Clinical Assistants posts are available to qualified practitioners, particulars of which can be had on application to the General Superintendent.

UNIVERSITY OF LIVERPOOL.

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Doctor in Philosophy (Ph.D.), Master of Surgery (Ch.M.), Master of Hygiene (M.H.), and Master of Orthopædic Surgery (M.Ch.Orth.).

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 21 years on the day of graduation. At least two of the five years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The fee is £5 for each examination. The subjects of the First Examination are: (1) Chemistry, Inorganic, Organic, and Physical; (2) Biology (Zoology and Botany); and (3) Physics. The examination is divided into two parts—namely, (1) Chemistry and Physics, and (2) Biology; and candidates may present themselves in these parts separately. The subjects of the Second Examination are (*a*) Anatomy and Physiology (including Physiological Chemistry and Histology), and (*b*) Materia Medica and Pharmacy and Pharmacology. Candidates may present themselves in (*a*) or (*b*) separately. The subjects for the Final Examination are: (1) General Pathology, Morbid Anatomy, and Bacteriology; (2) Forensic Medicine, Toxicology, and Public Health; (3) Obstetrics and Diseases of Women; (4) Surgery, Systematic, Clinical, Operative, and Practical, including Ophthalmology; (5) Medicine, Systematic and Clinical, including Mental Diseases and Diseases of Children, and Therapeutics. The Final Examination is divided into three parts, the first consisting of subject (1), the second of subject (2), the third of subjects (3), (4), and (5). Candidates may present themselves in these parts separately. Candidates for the third part must have completed the fifth year of medical study.

Degrees of Doctor of Medicine and Master of Surgery.—No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least two years have elapsed since he passed the examinations for those degrees, or, in the case of the degree of Doctor, unless, having obtained substantially equivalent degrees in an approved University, he has subsequently spent two years in the University or in the Clinical School in the performance of research or the conduct of systematic clinical observations. Candidates for the degree of Doctor of Medicine are required to present either a published thesis together with, if desired, other published work, or an unpublished thesis together with copies of original work published in scientific journals or in the proceedings of scientific societies or otherwise. An examination is required if the work submitted is not of special merit. If the work submitted is of special merit but extremely specialised a candidate may be asked to submit a reasoned report on a subject set by the examiners.

The University has recently established a Diploma in Medical Radiology and Electrology—Part I., Physics; Part II., Radiology and Electrology. The parts may be taken at one examination or separately.

At this University the following Scholarships and Fellowships and Prizes are awarded:—(*a*) and (*b*) Robert Gee Entrance Scholarships, two annually, of £25 each, tenable for two years, Joint Matriculation Board Examination held in July, open to First M.B. Course Students; (*c*) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects, Perpetual Course at the University; (*d*) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination among Senior Students in Anatomy, Physiology, Pharmacology, and Materia Medica; (*e*) Derby Exhibition of £15, Competitive Examination among Fourth- or Fifth-year Students in Clinical Subjects, and Clinical School Exhibition of £15 annually for Fourth- or Fifth-year students; (*f*) University Scholarship of £25 for one year, awarded on results of Second Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £100 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Bio-Chemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £150, for one year; (*m*) Ethel Boyce Fellowship in Gynæcological Pathology, of £100, for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (*o*) Rankin Exhibition in Practical Anatomy, of £25, for one year; Samuels Memorial Scholarships, three at £20; numerous prizes and medals.

Medical School Buildings.—Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation. All the laboratories and class-rooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. A new building for Tropical Medicine has recently been opened.

Clinical Instruction.—The Clinical School of the University consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of six special hospitals—the Eye and Ear Infirmary, the Hospital for Women, Liverpool Maternity Hospital and Ladies' Charity, the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, and St. George's Hospital for Skin Diseases. These hospitals contain in all a total of about 1140 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

VICTORIA UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the University—viz, Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine is awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University and one year at least having been passed in the University subsequently to the date of passing the first M.B. Examination. All candidates for the degrees of Bachelor of Medicine and Bachelor of Surgery are required to satisfy the examiners in the several subjects of the following examinations. (These are now under revision.)

The First Examination.—(1) Chemistry and Physics; (2) Biology. Candidates must have attended during at least one year courses both of lectures and of laboratory work in each of the above-named subjects. The Examination is divided into two parts: Part 1, Inorganic and Elementary Organic Chemistry and Physics; Part 2, Biology. The candidates may pass in these parts separately under certain conditions.

The Second Examination. — (1) Anatomy and Histology; (2) Physiology, including Physiological Chemistry. Candidates may pass in (1) and (2) separately under certain conditions.

The Third Examination.—(1) Pathology; (2) Pharmacology and Therapeutics. These subjects may be taken separately under certain conditions.

The Final Examination.—(1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynæcology (including Clinical and Practical); (4) Forensic Medicine (including an Oral Examination); (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts.

Candidates for the Second Part of the Final Examination must have completed the sixth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The dissertation must embody the results of personal observation or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. The degree is conferred in the following branches: Surgery (Branch I.), Gynæcology (Branch II.), Ophthalmology (Branch III.), Laryngology, Otology, and Rhinology (Branch IV.).

Scholarships, Fellowships, and Prizes.—At this University there are 22 Foundation Scholarships, 12 Exhibitions, five being for subjects connected with medical study, a Surgical Prize, a University Fellowship (Leech Fellowship, £100), Research Fellowships in Public Health, and Honorary Research Fellowships. 13 Entrance Scholarships are tenable for Medical courses; one Scholarship is offered in Surgery, Biology, Physiology, and Diseases of Children respectively, and one General Medical and Surgical. Exhibitions are offered in Physiology and Anatomy, and one for French and German. "The Dumville" Surgical Prize is awarded on the results of the Final Examination in Surgery in the Summer Term, £15. The Leech Fellowship (£100) is for the encouragement of study and research, and is open to persons who have graduated M.B., Ch.B., in the University not more than 18 months previously. The Honorary Research Fellowships, tenable for two years, conferring the right of free use of the laboratories, are awarded generally in October on application, with evidence of capacity for independent investigation.

There are many entrance scholarships, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and a library. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped for cancer research and investigation in general pathology. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica. In the public health department, which is lodged in a separate institute in York Place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, a lunatic asylum, and a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Clinical Instruction.—THE MANCHESTER ROYAL INFIRMARY.—The Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 671 patients. The medical side consists of five units, each unit having a testing room for the scientific investigation of morbid products and a class-room. The surgical beds are also arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing, and apparatus rooms, and its own class-room attached. All of these units are occupied. The fine educational block provides very handsomely for the wants and comforts of the students, there being separate suites of rooms for the men and the women, and also a large common reading room, a lecture theatre, and a museum. The present annual average number of in-patients is 13,650, of out-patients 27,000, and the list of casualties in the accident room has averaged 17,000 per annum. About 9000 operations are performed annually in the operation theatres. Associated with the infirmary are: (1) the Convalescent Hospital at Cheadle, containing 136 beds; (2) the Royal Lunatic Hospital at Cheadle, accommodating with its branches 430 patients; and (3) the Central Branch in the city for casualty and out-patient work, and 50 beds for pensioners. The Associated Hospitals thus contain 1244 beds and are under the same management. Women students are admitted on the same terms as men.

Fees.—Medical Practice: Three months, 7½ guineas; six months, 12 guineas; 12 months, 18 guineas; full period required by the Examining Boards, 60 guineas.

Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College Syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

The Dean of Clinical Instruction is Dr. T. H. Oliver.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, Gartside-street, Manchester, and St. Anne's-on-the-Sea.—The hospital contains 190 beds and 28 in the Convalescent Home, St. Anne's-on-the-Sea. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. There is a new Massage and Electro-therapeutic Department. Two Clinical Assistants are appointed for periods of three or six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is a new Orthopædic Department. A special out-patients' day is held on Friday mornings at Gartside-street, and a ward at Pendlebury is devoted to cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Park-place, Cheetham Hill-road, Manchester.—The hospital contains 70 beds. Out-patients are seen daily from 8.30 to 10 A.M.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination.

The First Examination.—The First Examination consists of: Part I., Physics and Chemistry; Part II., Zoology and Botany. Candidates will be allowed to pass the two parts separately.

The Second Examination.—The Second Examination consists of: Part I., Anatomy and Physiology; Part II., Materia Medica and Pharmacy. Candidates will be allowed to pass the two parts separately.

The Final Examination.—The Final Examination consists of: Part I., Pathology and Bacteriology. Part II., Forensic Medicine and Public Health. Part III., Medicine: Systematic and Clinical, including Mental Disease and Diseases of Children; Surgery—Systematic, Clinical, and Practical; Obstetrics, and Gynæcology—Systematic, Clinical, and Practical; Pharmacology and Therapeutics. Candidates will be allowed to pass Parts II. and III. separately or together, and they may present themselves for examination in Part I. at the end of the tenth term.

These conditions are at present under review in connexion with the recommendations of the General Medical Council.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least one year has elapsed since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine are required to present a dissertation and, if the dissertation be accepted, may be required to pass an examination.

The first term commences on Oct. 1st. Prospectus, &c., can be obtained from the Dean of the Medical School.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods may do so on terms which may be obtained from the Dean.

Clinical Instruction.—THE LEEDS GENERAL INFIRMARY, in connexion with this medical faculty, has accommodation for 632 in-patients, including 88 beds at branch hospitals in the country. During the last year 10,277 in-patients and 41,857 new out-patients were treated. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electro-therapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynæcological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Asylum and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five years subsequently to the date of his matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

The First Examination.—The subjects of the examination are Chemistry, Physics, and Biology. The Intermediate B.Sc. Examination in these subjects will, on payment of the required additional fee, be accepted instead of this examination. Candidates must, after matriculation and the passing of the further examination in Physics and Chemistry, and registration as medical students, have attended courses of instruction (lectures and laboratory work) in chemistry, physics, and biology for one year each.

The Second Examination.—The subjects of the examination are Anatomy and Physiology.

The Third Examination.—The subjects of the examination are Pathology, Pharmacology, Anatomy and Physiology. Candidates must have completed the Lent Term of the fourth year of professional study.

The Final Examination.—The subjects of the examination are Medicine (including Forensic Medicine, Public Health, Mental Diseases, and Diseases of Children); Surgery; and Obstetrics (including Gynæcology). Candidates must have completed the fifth year of professional study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least one year previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B, Ch.B. at least one year previously, and must since have held for not less than six months a surgical appointment in a public hospital.

The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy Surgical Pathology, and Bacteriology.

Scholarships, &c.—At this University, in addition to four Edgar Allen scholarships of £125 a year for three years, holders of which can take the courses in the Faculty of Medicine, there are 8 scholarships and a Town Trust Fellowship. Full particulars as to curriculum, scholarships, &c., may be had on application to the Registrar or to the Dean of the Medical Faculty.

The Medical School.—The new buildings of the University opened in 1905 are situated at the west end of the city, adjoining Weston Park, and the Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of the Union Representative Council, elected annually. There are large and comfortable common rooms both for men and women students. A refectory is open daily at the University where students may obtain refreshments, lunch, dinner, &c., at extremely moderate prices. The University journal, *Floreamus*, edited by a committee of staff and students, is published each term. The University Halls, "Oakholme," Clarkehouse-road, and "Tapton Cliffe," Fulwood-road, are recognised by the Senate as halls of residence for women students; full particulars may be obtained of the tutor for women students.

Clinical Instruction.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes. These are as follows: The ROYAL INFIRMARY (Secretary, Mr. J. W. Barnes), containing 326 beds, with an annual average number of over 3800 in-patients, over 11,500 out-patients, and over 23,000 casualties; the Royal Hospital (Hon. Sec., *pro tem.*, to the medical and surgical staff, Mr. Vincent Townrow), with 191 beds, and an annual number of 3000 in-patients, over 20,000 out-patients, and nearly 20,000 casualties; and the Jessop Hospital for Diseases of Women, with 80 beds, about 900 in-patients, and about 3057 out-patients; also a Maternity department, with about 450 in-patients per annum and about 700 out-patient cases attended. Special courses on Fevers are held at the City Fever Hospitals (600 beds) and on Mental Diseases at the South Yorkshire Asylum (1610 beds). For purposes of clinical practice the practices of the Royal Infirmary and Royal Hospital are amalgamated, giving a total of 511 beds for the treatment of medical, surgical, and special cases. There are special departments for the treatment of Diseases of the Eye at each institution, with wards assigned to them. In addition to these the Royal Infirmary has special departments for the treatment of Diseases of the Skin and Ear, with beds assigned to them, whilst at the Royal Hospital there are special out-patient departments for Diseases of the Throat, Ear, Skin, Orthopædics, and Mental Diseases. Instruction is also given at the South Yorkshire Asylum (1694 beds). During the last year over 6000 patients passed through the wards of the two institutions, while those attending as out-patients numbered over 45,000. The department of Pathology and Bacteriology in the University is fitted with every requirement for the most advanced work in these subjects.

Fees.—The Medical Composition Fee is £38 a year for each of the five years.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women alike.

Conjoined Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics, of which three shall have been passed in the University, and two of these three subsequent to pass in the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations.

The First Examination.—The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.)

The Second Examination.—The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). Parts I. and II. may be passed separately or together.

The Final Examination.—The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine, Toxicology, and Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). Candidates may pass I. and II. together, or separately, and Forensic Medicine and Toxicology may, at the option of the candidate, be taken either with Part I. or Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—Candidates shall be Bachelors of not less than two years as such, during which period they shall have attended the Surgical Practice of an institution approved for the purpose. They shall pass an examination in Surgical Anatomy, Pathology, and Bacteriology, and Operative, Clinical, and General Surgery, and present to the University a Dissertation on some subject of Surgery. The degree may be taken also in General Surgery, and a Special Subject—e.g., Oto-Rhino-Laryngology, Ophthalmology, and Gynæcology.

Clinical Instruction.—The allied hospitals (BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL) have between them about 600 beds and extensive out-patient departments. special clinics for Diseases of Women and Children and those of the Eye Throat, and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well-equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High Frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 140 beds, and that of the Bristol Eye Hospital, with 40 beds. The total number of beds available for clinical instruction is therefore about 750.

Appointments.—(1) Undergraduate: Clinical clerkships, dresserships, also ophthalmic, obstetric, pathological and ear, nose, and throat clerkships, are tenable at the Bristol Royal Infirmary and the Bristol General Hospital. In these institutions the dressers reside in rotation free of charge. (2) Post-graduate: At the Bristol Royal Infirmary: Four house surgeons, £120 each per annum; two house physicians, £120; resident obstetric and ophthalmic house surgeon, £120; throat, nose, and ear house surgeon, £120; dental house surgeon, £120. All these appointments are made for twelve months. From the resident officers a senior resident officer is appointed at a salary of £200. At the Bristol General Hospital: Senior resident medical officer, £300 per annum; casualty house surgeon, £125 per annum; two house physicians, £125 per annum; house surgeon, £125 per annum; special obstetric physician, £125 per annum; house surgeon to special departments, £125 per annum; dental house surgeon, £300 per annum. All these appointments are for six months, except that of senior resident medical officer, which is for two years.

Scholarships.—The following are among the scholarships and other awards open to students of the school: The Ashworth Hallett Scholarship, value £45, open to women only; Two Martin Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value 9 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth-year students for general proficiency; the Augustin Prichard Prize, value 7 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in gynæcology; the Crosby Leonard Prize, value 7 guineas, for proficiency in surgery; the Suple Surgical Prize, a gold medal and 7 guineas; the Suple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12, for dressers; the H. M. Clarke Scholarship, value £15, for proficiency in surgery; the Sanders Scholarship, value £22 10s., for general proficiency; the Barrett-Roué Scholarship for proficiency in diseases of the eye, ear, nose, and throat, value £14.

Daily Post-graduate Study.—For those who are able to devote several hours each day to hospital practice the University offers special facilities for Post-graduate work. Qualified medical practitioners may be appointed as Clinical Assistants for a period of one or more months. They may act as Assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Fee, £3 3s. per month.

Post-graduate Clinical Work. — Demonstration courses with weekly lectures are held during May, June, and July. Fee, £2 2s. All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment at the Pathological Department.

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

This University has, inter alia, the privilege of granting Degrees in Medicine, and Diplomas in Public Health and Tuberculous Diseases. Preliminary courses of study for the Degrees in Medicine may be pursued at any of the constituent Colleges of the University—viz., at Aberystwyth, Bangor, Cardiff, or Swansea. The Welsh National School of Medicine is situated in Cardiff and is an integral part of the University College there.

University College, Cardiff. Welsh National School of Medicine.—This School is staffed on the Unit System and whole-time Professors of Medicine, Surgery, Pathology, Preventive Medicine, Physiology, and Anatomy have already been appointed. Professors of Obstetrics and Gynæcology, and Tuberculosis, and a Lecturer in Materia Medica and Pharmacology have also been appointed. There are also Lecturers appointed in the various special subjects. The Courses of Instruction, which are open to both men and women students, are adapted to meet the needs of those preparing for Degrees in Medicine and Surgery in the University of Wales, and certain of them also for Degrees in other Universities, and for the Diplomas of licensing bodies.

Students can complete the whole of their curriculum in the School, and qualify for the degrees of M.B., B.Ch. in the University of Wales. Hospital instruction is given at the Cardiff Royal Infirmary, at the City Lodge Hospital, and at other recognised Institutions. The attention of students about to matriculate is drawn to the numerous entrance scholarships offered for competition at the University College, Cardiff, most of which may be held by medical students. Full particulars of the examination for these may be obtained by application to the Registrar. Medical men wishing to prepare for the Diploma in Public Health or the Tuberculous Diseases Diploma of the University of Wales can attend complete courses of instruction in the School. Prospectuses can be obtained on application to the Dean of the Faculty of Medicine, or to Mr. D. J. A. Brown, Secretary, at University College, Cardiff.

Clinical Instruction.—King Edward VII. Hospital, Cardiff: Founded 1837. 450 beds.—Swansea General and Eye Hospital: Hospital, 260 beds, 225 civilians, 35 (sailor and soldier pensioners); Convalescent Home, 26 beds.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

1. *Regulations applying to all candidates who passed the required Preliminary Examination in General Education before Jan. 1st, 1923.*

Professional Examinations.—There are three Examinations, called herein the First Examination, the Second Examination, and the Third or Final Examination, each being partly written, partly oral and partly practical. These examinations will be held in the months of January, April, July, and September or October unless otherwise appointed. Every candidate must give notice in writing to Mr. F. G. Hallett, O.B.E., Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, W.C., 14 clear days before the day of the examination, transmitting at the same time the required certificates.

The subjects of the *First Examination* are—Chemistry, Physics, and Elementary Biology. A candidate may take this examination in two parts at different times (Chemistry and Physics must be taken together until the required standard is reached in both or in one of these subjects, but a candidate will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other). A candidate will be admitted to examination in Chemistry and Physics, and in Elementary Biology on producing evidence of having passed the required Preliminary Examination and of having received instruction in these subjects at a recognised institution. A candidate rejected in one part or more of the First Examination will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection, and he will be re-examined in the subject or subjects in which he has been rejected. If referred in Chemistry, Physics, or Biology he must produce evidence of further instruction at a recognised institution. Any candidate who shall produce satisfactory evidence of having passed an examination for a degree in Medicine in any of the subjects of this examination conducted at a university in the United Kingdom, in India, or in a British colony will be exempt from examination in those subjects.

The fees for admission to the *First Examination* are as follows: For the whole examination, First Admission, £10 10*s.*; re-examination in Chemistry, £3 3*s.*; re-examination in Physics, £2 2*s.*; re-examination in Biology, £3 3*s.* Second Conjoint: This examination is in two parts—viz.: Part I., Anatomy and Physiology; Part II., Materia Medica and Pharmacology. A candidate must have attended at a recognised medical school, lectures on Anatomy, Physiology, and a course of Practical Physiology and Histology, and have dissected for twelve months during the ordinary sessions. He must also attend three months' lectures or demonstrations in Pharmacology and receive instruction in Practical Pharmacy. Part II. may be passed at the same time as Part I., or before or after that part, provided the conditions of admission to the whole examination have been fulfilled. The study of Anatomy and Physiology before passing in two of the three subjects of the first examination is not recognised. If rejected. a candidate before being admitted to re-examination must continue his studies at a recognised medical school for not less than three months.

Second Examination: £10 10*s.*; re-examination in Part I., £6 6*s.*; re-examination in Part II., £3 3*s.*

The subjects of the *Third* or *Final Examination* are: Part I., Medicine, including Medical Anatomy, Pathology, Therapeutics, Forensic Medicine, and Public Health. Part II., Surgery, including Pathology, Surgical Anatomy, and the use of Surgical Appliances. Part III., Midwifery and Diseases Peculiar to Women. Candidates may present themselves for Parts I., II., and III. of the examination separately or together at the expiration of not less than two years (24 months) from the date of passing the Second Examination on production of the certificates of study required for the respective parts, provided that the examination is not completed before the expiration of five years from the date of passing the Preliminary Examination.

The fees for admission to the *Third* or *Final Examination* are as follows: Third Examination: £21; re-examination in Part I., Medicine, £6 6*s.*; Part II., Surgery, £6 6*s.*; Part III., Midwifery and Diseases of Women, £4 4*s.* Members of English, Scotch, or Irish Universities £5 5*s.* for first admission to the examination and £36 15*s.* for the diplomas.

A candidate referred on the *Third* or *Final Examination* will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection and will be required, before being admitted to re-examination, to produce a certificate, in regard to Medicine and Surgery, of having attended the Medical and Surgical Practice, or the Medical or Surgical Practice, as the case may be, during the period of his reference; and in regard to Midwifery and Diseases Peculiar to Women a certificate of having received, subsequently to the date of his reference, not less than three months' instruction in that subject by a recognised teacher.

2. *Regulations applicable to candidates who passed the required Preliminary Examination in General Education on or after Jan. 1st, 1923.*

Students are required to pass a *Pre-Medical Examination* in Chemistry and Physics conducted by the Conjoint Examining Board before commencing the five years curriculum of professional study or some other examination recognised by the Board—namely, the examination in Chemistry and Physics for the degree in Medicine of any University recognised by the Board; the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board; the Higher Certificates of London, Bristol, Durham Universities, and the Joint Matriculation Board of the Northern Universities. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. He will be admitted to the examination on producing evidence of having passed the required Preliminary Examination in General Education and of having received instruction during 180 hours in Chemistry and 120 hours in Physics to the satisfaction of his teachers. These courses may be commenced or attended before the required Preliminary Examination in General Education is passed. The examination is partly written, partly oral and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of a period of not less than three months and he must produce evidence of further instruction in the subject or subjects of failure. The fee for the examination is £3 3*s.*, for re-examination in Chemistry £2 2*s.*, and for re-examination in Physics £1 1*s.*

There are two Professional examinations called the *First* and *Final Examinations.* The courses of study for these examinations must not be commenced until the Pre-Medical examination in Chemistry and Physics or some equivalent examination has been passed.

The subjects of the First Professional Examination are: Section I. (*a*) Anatomy, including Histology and Embryology. (*b*) Physiology, including Bio-Chemistry. Section II. Pharmacology, Practical Pharmacy and Materia Medica. A candidate must have attended at a recognised Medical School courses of instruction in Anatomy, including Embryology during five terms, during which he must have dissected the whole body, courses of instruction in Physiology, including General Biology, Bio-Chemistry and Bio-Physics during five terms, courses of instruction in Pharmacology, Practical Pharmacy and Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (*a*) and (*b*) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the Final Professional Examination. The fee for the First Professional Examination is £10 10*s*., for re-examination after rejection in Section I. £6 6*s*., for re-examination after rejection in either part of Section I. £3 3*s*., for re-examination after rejection in Section II. £3 3*s*. A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subject or subjects.

Final Professional Examination.—The subjects of the Final Professional Examination are: Section I. (*a*) Pathology, including Morbid Anatomy, Morbid Histology and Clinical Pathology. (*b*) Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynæcology. The examination is partly written, partly practical, partly clinical and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the Final Examination separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. A candidate who produces evidence of having passed an examination for a degree in medicine in the subjects of Pathology and Bacteriology at a University recognised by the Board is exempted from Section I. The fee for admission to Section I. is £4 4*s*.; for admission to Section II., Part I., £10 10*s*.; Part II., £10 10*s*.; Part III., £6 6*s*.; and the re-examination fees are respectively £3 3*s*., £6 6*s*., £6 6*s*., and £4 4*s*.

Students of recognised universities in England, Scotland, and Ireland, who have passed examinations for a degree in Medicine at their universities in the subjects of the First and Second Examinations of the Examining Board, may enter for the Final Examination at the expiration of two years from the date of passing in Anatomy and Physiology on production of the required certificates.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First and Second Examinations of the Examining Board may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, and in Tropical Medicine and Hygiene. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, a Colonial, or a Foreign University. Particulars and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, London, W.C.

ROYAL COLLEGE OF PHYSICIANS OF LONDON:

THE MEMBERSHIP AND FELLOWSHIP.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—Every candidate must have attained the age of 25 years, and be already registered or have passed a qualifying examination in accordance with the Medical Act of 1886, or obtained the degree of Doctor or Bachelor of Medicine at a University in the United Kingdom, in India, or a British colony, or foreign qualification, for which the courses of study and the examinations have been adjudged by the Censors' Board to be satisfactory. The nature and extent of this examination will, in the case of each candidate, be determined by the Censors' Board. All other candidates must produce proof of having passed the examinations required for the Licence of the College. The examination is directed partly to pathology and partly to the practice of medicine. The fee for admission as a Member of the College is 40 guineas, except when the candidate for Membership is a Licentiate of the College, in which case the fee already paid for the Licence shall be deducted from the 40 guineas. The fee for the examination is £6 6*s*.

Fellowship.—The *Fellows* are selected annually from the ranks of the *Members* by the Comitia of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND:

THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology, and those of the Second Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly vivâ voce and include the examination of patients and the performance of operations on the dead body. The First Examination will in future years be held in June and December and the Second Examination in May and November.

The fees for examination are:—First Examination, first admission 8 guineas, and for each re-admission 5 guineas. Second Examination, each admission, 12 guineas. Of such examination fees 20 guineas will be reckoned as part of the fee payable upon admission to the Fellowship. The fee to be paid upon admission to the Fellowship is 30 guineas, except when the candidate is a Member of the College, in which case the fee is 20 guineas.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First and Second Examinations of the English Conjoint Board, of the equivalent examinations in his University, on the production of certificates of attendance upon certain prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination, on producing satisfactory evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

The Regulations may be obtained on application to the Director of Examinations, Examination Hall, Queen-square, Bloomsbury, London, W.C. 1.

SOCIETY OF APOTHECARIES OF LONDON.

The Primary examination is held quarterly in two parts. Part I. Elementary Biology; Chemistry, Chemical Physics; Practical Chemistry; and Materia Medica and Pharmacy. Part II. includes Anatomy, Physiology, and Histology. This examination cannot be passed before the completion of twelve months Practical Anatomy with Demonstrations, and these subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final examination is held monthly except in September. Part I. Clinical Surgery: Principles and Practice of Surgery, Surgical Pathology, and Surgical Anatomy, Operative Manipulation, Instruments, and Appliances. Part II. Clinical Medicine: Medicine, Pharmacology, Pathology, and Morbid Histology; Forensic Medicine, Hygiene, Theory and Practice of Vaccination; and Mental Diseases. Part III. includes Midwifery, Gynæcology, and Diseases of New-born Children and the Use of Obstetric Instruments and Appliances.

The course of study for the *Final examination*, includes attendance on the Surgical and Medical Practice, with Post-mortem Examinations, at a hospital connected with a medical school for a period of two winter and two summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The course of medical study must extend over five years, and the offices of dresser or clinical clerk must be held at a hospital or other institution recognised by the Society. Two years must elapse after a candidate has passed the examination in Anatomy and Physiology before sitting for any part of the Final examination.

Evidence shall also be given of practical instruction in Infectious Diseases and in Mental Diseases (at a lunatic asylum or in the wards of an institution containing a special ward set apart for the treatment of mental diseases), and in any two of the following subjects: Ophthalmic Surgery, Laryngology with Rhinology and Otology, Dermatology, and Diseases of Children. Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Licence is 20 guineas. Female candidates are admitted to examinations. The examination offices are open from 10 A.M. to 4 P.M.; on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Secretary, Court of Examiners, Society of Apothecaries of London, Blackfriars, E.C. 4.

METROPOLITAN ANCILLARY SCHOOLS AND HOSPITALS AFFORDING FACILITIES FOR CLINICAL OBSERVATION.

The institutions which follow provide to the medical student and medical graduate facilities for different forms of instruction and clinical observation. In each case further information can be obtained from the secretary of the hospital.

The Seamen's Hospital Society possesses three hospitals—the *Dreadnought* Hospital at Greenwich, 250 beds, and the Branch Hospital in the Royal Victoria and Albert Docks, E., 50 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, 50 beds, London, N.W. 1; King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds, and the Angas Home, 30 beds. It has also a Dispensary in the East India Dock-road from which patients are transferred to the hospitals. The London School of Tropical Medicine is attached to the Hospital for Tropical Diseases. Sessions commence approximately Sept. 25th, Jan. 9th, and July 24th. Students must be qualified Medical Practitioners or be in the fifth year of their medical studies. Accommodation for 100 Students. Fully equipped Laboratories are provided for the study of Entomology, Helminthology, Protozoology, and General Medical Zoology.

In conjunction with the Fellowship of Medicine arrangements have been made for a short course distributed over four weeks. Secretary: Sir P. J. Michelli, C.M.G.

West London Hospital, Hammersmith, W. 6.—This hospital has 159 beds, all of which are constantly in use. 2319 in-patients and 36,374 out-patients, whose attendances numbered 182,697, were treated last year. Attached to the hospital is the West London Post-Graduate College. The practice of the hospital is reserved exclusively for qualified men, no junior students being admitted. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards. Clinical assistantships are *obtainable* in the various general and special out-patient departments. Special classes are held in Diseases of the Throat and Nose, Skin, and Eye, and in Gynæcology, Medical Electricity, Operative Surgery, Bacteriology, Anæsthetics, Intestinal Surgery, Medical and Surgical Diseases of Children, Blood and Urine, Clinical Microscopy, Cystoscopy, Venereal Diseases, and Operative Ophthalmology, Radiography, X Ray Therapy. The accommodation for post-graduates consists of a lecture room, together with reading, writing, and class rooms, &c. The hospital has a fully equipped pathological laboratory at which instruction is given in elementary bacteriology. The fees for hospital practice, including lectures, are £4 4*s.* for one month, £9 9*s.* for three months, or £22 1*s.* for one year. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave. Further information can be obtained on application to the Dean, Dr. Arthur Saunders, at the Hospital. Secretary of the Post-graduate College: Mr. C. Cole. Secretary of the Hospital: Mr. H. A. Madge.

Royal Northern Hospital, Holloway-road, N. 7.—This hospital is recognised by the Examining Board in England of the Royal Colleges of Physicians and Surgeons as a place of study during the fifth year of the medical curriculum. Besides the honorary staff there are six anæsthetists, pathologist, resident medical officer, two resident house physicians three resident house surgeons, and resident casualty officer. The hospital contains 210 beds, which are fully occupied. There is also a ward for children under five years of age. The large rectangular and circular wards, each of which contains 25 beds, the observation wards, the two operation theatres, general and special out-patient and pathological departments, are specially designed with a view of offering the greatest facilities for clinical work. There is also a well-appointed physiotherapeutic department. The pathological department has been extended and is under the control of a Director of Clinical Pathology. The Reckitt Convalescent Home at Clacton-on-Sea belongs to the Hospital. It contains 30 beds. Special departments have also been established for the treatment of tuberculosis and venereal diseases. A Hospital of Recovery containing 60 beds has now been established at "Grovelands," Southgate, patients being removed from the main hospital by ambulance five or six days after operation. Medical practitioners are cordially invited to see the general and special practice of the hospital. Demonstrations are given daily in the wards and out-patients departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments and may receive certificates at the end of their terms of office.

Special Departments.—During the past year special departments have been created in genito-urinary and neurological diseases and a fracture department.

Post-graduate Facilities.—In association with the Fellowship of Medicine two-week "refresher" courses have been arranged for March, July, and November in each year. These will include teaching in general medicine and surgery, and special lectures and demonstrations in special subjects.

Further particulars from the Secretary of the Medical Committee at the Hospital.

Prince of Wales's General Hospital, Tottenham, N. 15.—This hospital is in the midst of a densely populated neighbourhood and contains medical, surgical, gynæcological, and children's wards, having 125 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin diseases, plastic surgery, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are four resident medical officers, and clinical assistants are appointed under certain conditions. A special intensive post-graduate course will be held in the autumn. Further particulars in regard to the hospital may be obtained from Mr. E. Gillespie, Secretary to the Medical Committee, 24, Weymouth-street, W. 1; or from Dr. J. B. Banister, Dean of North-East London Post-Graduate College, 39, Harley-street, W. 1.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. (Established 1873; Incorporated 1917).—The hospital contains 120 beds. The in-patients in 1922 were 1059, and the out-patients and casualties numbered 13,141 new cases. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Mondays at 2 P.M., Tuesdays, Wednesdays, Thursdays, and Fridays at 9 A.M.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.—The Hampstead General Hospital (Haverstock-hill) and the North-West London Hospital (formerly at Kentish Town) have been amalgamated since 1907. The Hampstead General Hospital (128 beds—viz., 102 free, 6 isolation, &c., and 20 paying or contributory) accommodates the in-patients from the districts hitherto served by both hospitals. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients department, Bayham-street, Camden Town. Further particulars from the Secretary at the hospital.

SOUTH LONDON HOSPITAL FOR WOMEN, South Side, Clapham Common, S.W.; Out-patient Department: 86-90, Newington Causeway, S.E.—This hospital, officered entirely by medical women, is a general hospital for women, girls, and small children of both sexes, and provides accommodation for 80 patients. All diseases are treated with the exception of acute infectious fevers and mental disease. There are Ophthalmic, X ray and Electrical, Pathological, Physio-Therapeutic, and Dental Departments. The hospital is a centre for the treatment of venereal diseases under the Public Health (Venereal Diseases) Regulations, 1916. The provision of additional facilities for post-graduate training for medical women is one of the special objects of the hospital. The number of in-patients treated during the year 1922 was 1187. At the Out-patient Department in Newington Causeway 8275 new cases were treated during the past year, the total number of out-patient attendances amounting to 32,045. Clinical assistants (qualified women only) are from time to time appointed in the Out-patient Department. Two resident students act as clinical clerks in the surgical wards. Secretary: Miss M. E. Ridler.

FRENCH HOSPITAL AND DISPENSARY, Shaftesbury-avenue, W.C.—This hospital, which was founded in 1867 to afford medical treatment for poor foreigners who speak the French language, has 74 beds. The Convalescent Home and Retreat for Aged French People at Brighton contains 61 beds. Secretary: Mr. G. Pondepeyre.

ITALIAN HOSPITAL, Queen-square, W.C.—This institution was established in 1884 for the maintenance and medical treatment of Italian and Italian-speaking people, irrespective of their religious and political opinions, who may be suffering from sickness or bodily infirmity, but the sick poor of any nationality are also admitted for treatment. The institution also provides surgical and medical relief to Italians and others not being inmates of the hospital. It has 50 beds.

GERMAN HOSPITAL, Dalston, E. 8.—This hospital was founded in 1845 with the object of supplying medical aid to poor people speaking the German language and for others in cases of emergency and accident. It has 138 beds and a sanatorium with 10 beds.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC (Albany Memorial), Queen-square, Bloomsbury, W.C.—The hospital, with the Finchley branch, and branches in Bloomsbury and Clapham Park, contains 265 beds and cots. The out-patient physicians attend every Monday, Tuesday, Thursday, and Friday at 2 P.M., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held three times every year, usually commencing in January, May, and October and lasting eight weeks. Special Courses in Neurological Ophthalmology, Neuro-Pathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist. The hospital has been recognised by the Conjoint Board of England as a place where part of the fifth year may be devoted to clinical work. All communications concerning clinical appointments, lectures, hospital practice, and fees should be addressed to the Secretary at the hospital.

HOSPITAL FOR EPILEPSY AND PARALYSIS, &c., Maida Vale, W. (85 beds).—Both in-patient and out-patient departments of this hospital are open free to students as well as to medical graduates. Secretary and General Superintendent: Mr. H. W. Burleigh. The out-patient department is open every week-day except Saturday at 2 P.M.

WEST END HOSPITAL FOR NERVOUS DISEASES.—Out-patient Department, 73, Welbeck-street, W. 1; In-patient Department, Gloucester Gate, Regent's Park, N.W.; 72 beds, over 42,000 Out-patient attendances. A Pathological Department is now installed and further improvements are to be carried out in the summer vacation. A series of clinical demonstrations, apart from the general practice of the hospital, is held regularly each session and the hospital is coöperating with the Fellowship of Medicine in the programme of special post-graduate teaching organised by the Association. The Savill Memorial Prize (value £15) and Medal are offered annually for competition among post-graduate and undergraduate students who have attended at the hospital. For further particulars apply to C. C. Worster-Drought, M.D. (Dean), or to J. P. Wetenhall, B.A. (Oxon.), Secretary, 73, Welbeck-street, W. 1.

BETHLEM ROYAL HOSPITAL, St. George's-road, S.E.—This hospital is open for the admission of two Resident House Physicians who have recently obtained their diplomas to practise Medicine and Surgery. They are permitted to reside in the hospital for a term generally not exceeding six months, commencing May 1st and Nov. 1st, and are provided with apartments, complete board, attendance, laundry, and a salary at the rate of £100 per annum. They are under the direction of the Physician Superintendent and are elected by the Committee from candidates whose testimonials appear to be most satisfactory. The students of certain specified London Medical Schools receive clinical instruction in the wards of the hospital and qualified practitioners and other students may attend for a period of three months on payment of a fee. A Department for Nervous Diseases has been instituted in a building quite apart from the main hospital. Neurological and early mental cases are dealt with. A Course of Lectures and Practical Instruction for the Diploma in Psychological Medicine granted by the various Universities, will commence in the middle of September. For particulars apply to the Physician Superintendent.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—The hospital contains 333 beds. The Sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six house physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. An additional month may be spent at the Sanatorium. Pupils are admitted to the practice of the hospital: terms £1 1s. for one month; three months, £2 2s. Clinical Demonstrations are given throughout the year by members of the medical staff. Clinical assistants are appointed to the physicians in the out-patient department and clinical clerks to the physicians in the wards. The hospital has been recognised by the Conjoint Board for England as a place where six months of the fifth year may be spent in clinical work. The medical practice of the hospital is also recognised by the University of London, the Apothecaries' Society, and the Army and Navy and Indian Medical Boards. Dean of the Medical School: Dr. L. S. Burrell, from whom particulars of lectures, clinical appointments, and hospital practice can be obtained.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E. 2.—During the past year 1201 in-patients have been treated in the wards. The out-patients treated during 1922 numbered 9951. Special Departments: Surgical, Laryngological, X ray, Electro-Cardiographic. Assistants are appointed to the Clinics, and a limited number of research workers to the Pathological Department. The In-patient staff visit generally in the afternoon, and welcome medical practitioners; Out-patients at 2 p.m. Graduates desiring Assistantships in any department should apply to the head of the Department. Physicians to In-patients: W. J. Hadley, E. H. Colbeck, Clive Riviere, A. G. Levy, A. J. Scott-Pinchin, F. G. Chandler; Surgeon: W. H. C. Romanis; Laryngologist: W. G. Howarth; Physicians to Out-patients: Sir Percy W. Bassett-Smith, J. B. Alexander, J. B. Christopherson; Electro-Cardiographic Department: Dr. A. J. Scott-Pinchin; Radiologist: Dudley M. Stone; Pathologist: S. R. Gloyne. Tuberculosis Dispensary (Boroughs of Bethnal Green and part Hackney) Tuberculosis Officers: H. T. Howell and F. W. Hamilton. Other information from the Secretary of the Hospital.

Royal Chest Hospital (for all affections of the heart and lungs), City-road, E.C. (80 beds). Branch of the Royal Northern Hospital, Holloway.—This hospital provides accommodation for 80 in-patients. Expenditure for 1922 £15,068, income £11,476. The attendance of out-patients averages 30,000 annually. Secretary: Mr. G. G. Panter.

The Mount Vernon Hospital for Tuberculosis and Diseases of the Lungs and Heart, Northwood, Central Out-patient Department, Fitzroy-square, W.—The hospital contains 157 beds, Medical and Surgical; 50 beds reserved for children requiring surgical aid. Number of in-patients, 473; out-patients, 2024. Resident Medical Staff. Clinical Demonstrations are given by the Visiting Medical Staff at the hospital at Northwood. Clinical assistants are appointed to physicians in the wards and in the out-patient department. Secretary: Mr. W. J. Morton.

Queen Charlotte's Lying-in Hospital and Midwifery Training School, Marylebone-road, N.W.—This hospital receives about 2000 patients annually, besides having a large out-patient department. Medical pupils are received at all times of the year. Pupils have unusual opportunities of seeing obstetric complications and operative midwifery, on account of the very large number of primiparous cases—nearly one-half of the total admissions. Clinical instruction is given on the more important cases which present themselves. They also receive valuable instruction in the Ante-natal Department, where over 4000 patients attend yearly. Special Lecture-demonstrations are given by members of the staff. Certificates of attendance at this hospital are recognised by all the Universities, Colleges, and licensing bodies. Pupil midwives and monthly nurses are received and specially trained. A Residential College provides accommodation for five men at a time, students and qualified practitioners, and is opposite the hospital, with which it is in telephonic communication. Arrangements have been made for Medical Students to receive the preliminary instruction in Practical Midwifery recommended by the General Medical Council. Women students are received. For further particulars application should be made to Mr. Arthur Watts, Secretary, at the hospital.

Hospital for Women, Soho-square, W.—The teaching in connexion with the above hospital has been greatly extended, and is available for Post-Graduates only, in limited numbers. Every facility is afforded them, by the teaching staff, of obtaining experience in diagnosis and treatment of Gynæcological diseases. The hospital contains 68 beds, and the out-patient attendances are over 14,000 per annum. Operations take place daily at 2 o'clock except on Saturdays. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated with the hospital is the London School of Gynæcology, comprising attendance in Out-patient Department, operating theatre, clinical lectures, and X ray treatment. For further particulars apply to the Secretary.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Qualified practitioners are admitted as clinical assistants to both the in- and out-patient departments. The fees, payable in advance, are £3 3s. for three months. Full particulars may be obtained on application to the Secretary at the hospital. There are 70 beds. Secretary: Mr. G. H. Hawkins.

East London Hospital for Children and Dispensary for Women, Glamis-road, Shadwell, E.—The hospital maintains 130 cots, and on an average 245 out-patients are seen daily. Clinical instruction is given by the physicians and surgeons to the hospital, which is recognised by the Conjoint Board for England as a school of medical teaching for students in the fifth year of the curriculum. All particulars may be obtained on application to the Secretary. Two clinical clerkships for qualified or unqualified students are open every three months subject to reappointment if desired. Clinical assistants (qualified men only) are from time to time appointed in the out-patient department. Any additional information may be obtained on applying to Mr. W. M. Wilcox, the Secretary.

The Hospital for Sick Children, Great Ormond-street, W.C. 1, contains 244 beds. The hospital having been recognised by the Conjoint Board for England as a place where, under the new curriculum, six months of the fifth year may be spent in clinical work, the practice is arranged to meet this need and is open to students of both sexes who have completed four years of medical study and also to qualified medical men and women. The medical staff are recognised by the University of London as teachers in Diseases of Children. Arrangements have also been made with University College Hospital and the London School of Medicine for Women for the routine admission of their students of both sexes to clerkships and dresserships in the wards. Appointments are made every three months to six medical clerkships, which are open to students of the hospital. Clinical instruction is given daily by members of the visiting staff. Fees for hospital practice, one month, £2 2s.; three months, 5 guineas; perpetual ticket, 10 guineas. Clinical Clerks, 1 guinea for one month. Ophthalmological Clerkships.—Clinical Clerks are appointed once a month. Fees £1 1s. for one month's attendance. Pathological Clerkships.—Facilities are afforded for obtaining theoretical and practical instruction in Clinical Pathology and Bacteriology in the Pathological Laboratories. Clerks attend for about four hours daily. Fees: For one month, £3 3s.; for two months, £5 5s.; for three months, £6 6s. A reduction is made in the case of those already holding tickets for general attendance at the hospital. Time so spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge, and by the Conjoint Board for England as part of the approved curriculum for students entering for a final examination. These appointments are open to students of all recognised medical schools. In addition, special lectures in post-graduate work are held throughout each term of the year, as well as routine post-graduate instruction daily. Details may be obtained by application to the Dean or Secretary at the hospital. The medical school is a constituent part of the new London Post-Graduate Association. Secretary: Mr. James McKay.

EVELINA HOSPITAL FOR SICK CHILDREN,* Southwark Bridge-road, S.E.—This hospital contains 76 cots and a very extensive Out-patient Department. About ten clinical assistants (either sex), to work with the Honorary Medical Staff for Out-patients, are appointed quarterly for a period of three months: there is no salary attached to these posts; but, on the other hand, no fees are charged.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—The hospital contains 130 beds and has a large out-patient department (over 1400 weekly); the home at Broadstairs has 50 beds. Out-patients are seen as under:—Diseases of the Eye: Tuesday, 2 P.M. Diseases of the Skin: Monday, 1.45 P.M. Whooping-cough Cases: Friday, 2 P.M. Dental Cases: Thursday, 1.30 P.M. Medical and Surgical Cases: Mornings at 9.30 and 11.30. Accidents and urgent cases are admitted at any time. Secretary: Mr. D. St. John Bamford.

A Private Nursing Home for Children is now open at 29, Tite-street, in connexion with and adjacent to the hospital. Terms: £1 1s. per day or £5 5s. per week. Application for admission should be made to the Secretary. Patients must be under the care of a consultant of one of the hospitals of London, and the question of payment for his fees is a matter of arrangement between him and the child's parents.

QUEEN'S HOSPITAL FOR CHILDREN (*late North-Eastern Hospital for Children*), Hackney-road, Bethnal Green, E. 2. (Telephone 305 and 534 Dalston.) For the sick children of the poor under 14 years of age. Established 1867. 134 beds in London and 36 at the seaside branch, "Little Folks" Home, Bexhill.—During the past year 1878 in-patients and 43,647 out-patients (attendance 115,027) were received. The surgeons attend on Tuesdays at 9.30 A.M. and Wednesdays and Fridays at 1.45 P.M.; the physicians daily at 1.45 P.M., except Saturday, and Wednesday and Friday, 9.30 A.M., as well as 1.45 P.M. Whooping-cough Physician: Saturday, 9.30 A.M. The practice of the hospital is open to students by arrangement with the medical staff. Clinical demonstrations open to medical practitioners and students of medicine will be announced in the medical journals. Applications should be made to the Secretary, Mr. T. Glenton-Kerr.

BELGRAVE HOSPITAL FOR CHILDREN, Clapham-road, S.W.—Clinical Assistants (men or women) are from time to time appointed to the members of the Visiting Staff attending in the Out-patient Department at this hospital, and facilities are given for attendance in the wards.

ALEXANDRA HOSPITAL FOR CHILDREN WITH HIP DISEASE (late of Queen-square, W.C.), Kettlewell Home, Swanley, Kent (in connexion with St. Bartholomew's Hospital).—At this hospital cases of hip-disease, spinal caries, and tuberculous diseases of other bones and joints are treated. Students who have obtained a recommendation from their teachers can attend to see the practice. In-patients, Swanley, Kent; Out-patients, St. Bartholomew's Hospital; Fridays, 1.30 P.M. Apply for particulars to the Dean of the Medical College, St. Bartholomew's Hospital, London, E.C. 1.

ROYAL LONDON OPHTHALMIC HOSPITAL (Moorfields, 1804–1899), City-road, E.C. 138 beds.—This hospital, known as Moorfields Eye Hospital, was moved in 1899 to larger buildings in City-road. Last year there were 2614 in-patients, the out-patients were 47,532 of whom 40,735 were new out-patients, and the attendances were 117,120. Operations are performed daily from 10 A.M. to 1 P.M., and four surgeons attend on each day. Students are admitted to the practice of the hospital. Fee for six months, £3 3s.; perpetual, £5 5s. Special courses of instruction, which extend over a period of five months, are given by members of the Surgical Staff; beginning in October and March. A composition fee of 24 guineas (£25 4s.) will entitle students to a perpetual ticket, and will admit them once to all the lectures and classes and to the examination for the hospital's full certificate. A special course is also held in the preliminary subjects (Anatomy, Physiology, and Optics) for the various degrees in Ophthalmology. The fee for this course is 12 guineas. Students of the hospital are eligible for the offices of house surgeon or clinical and junior assistants. Junior assistants are appointed every three months. Any further information will be furnished by Mr. Robert J. Bland, Secretary Superintendent.

ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, King William-street (next door to Charing Cross Hospital), Strand, W.C. 2.—The hospital contains 42 beds. Out-patients, who number over 14,000 annually, are seen daily at 1 P.M., and operations are performed in the theatre at 3 P.M. The practice of the hospital is open to both men and women practitioners and students. Clinical evenings, at which interesting cases are shown and discussed, are held twice each term at 8 P.M. on the second Tuesday of the month. In addition to the ordinary clinical instruction, a systematic course of Lectures and Practical Classes commences in October and May. Lectures in this course are given daily (except on Saturday) at 4.30 P.M., including all subjects required by candidates for the D.O.M.S., R.C.P. & S. Eng., Part II., and practical instruction is given in Operative Surgery and Ophthalmic Pathology and Bacteriology. A corneal microscope has recently been purchased and instruction in the Microscopy of the Living Eye can now be obtained. Fees: One month, £1 1s.; three months, £2 2s.; six months, £3 3s.; perpetual, £5 5s.; composition fee for perpetual ticket and attendance at classes (except Operative Surgery and Pathology, for which fee in each case is £2 2s. per course), £10 10s. Students of the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant, and senior or junior clinical assistant. Full details can be obtained on application to the Dean.

ROYAL EYE HOSPITAL, St. George's-circus, Southwark, S.E. 1.—There are 40 beds and 2 cots. In 1922 there were 50,911 attendances in the Out-patient Department, the new patients being 20,923. The daily average of attendances was 169 patients. In-patient admissions numbered 946. Clinical instruction is given to students and post-graduates daily at 2.30 P.M., and Lectures, Demonstrations, and Laboratory Classes are arranged in preparation for examinations in Ophthalmology. Post-graduate students are eligible for appointment as Clinical Assistants and as Refraction Officers. Dean: Mr. A. D. Griffith.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, St. Pancras, W.C.—This hospital has 40 beds and clinical teaching is given daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on refraction and other subjects, to meet the requirements of the Conjoint Board for the D.O.M.S., and of the University of London for the M.S. in Ophthalmology, are given during the winter months, commencing in October. The out-patient work begins at 1 o'clock, and operations are performed daily between 2 and 4 o'clock. This school is recognised as a teaching institution by the Universities of London and Oxford, and the Conjoint Board of the Royal Colleges of Surgeons and Physicians. The school has also undertaken to receive a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. Secretary: H. R. S. Druce.

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* No returns.

Western Ophthalmic Hospital, Marylebone-road, N.W.—16 beds. Out-patient attendances, 30,264. Both In-patient and Out-patient Departments of this Hospital are open to medical graduates. Fees £1 1s. per three months. Honorary Secretary: H. W. Burleigh.

National Hospital for Diseases of the Heart, Westmoreland-street, London, W. (founded 1857).—The practice of the hospital, both in the wards and out-patient department, is open daily to post-graduates and others, and will be found valuable by those seeking the higher qualifications—e.g., M.D., M.R.C.P., &c. Systematic courses of instruction, with lectures and clinical demonstrations, are arranged during the winter and summer sessions; in addition an intensive course, of roughly a fortnight's duration, takes place in February, July, and October of each year. The hospital is fully equipped with all the modern instruments for the investigation of the diseases of the Cardio-Vascular system, and facilities exist for those requiring practical instruction in Electro-cardiography, X Rays, and other graphic methods. Clinical Assistants in the Out-patient Department are appointed from time to time. For further particulars apply to the Dean of the Medical School (Dr. Parsons-Smith), or to the Secretary, at the hospital.

Hospital for Diseases of the Throat, Golden-square, W. (with which is amalgamated the London Throat Hospital, Great Portland-street).—Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 5 P.M., and on Tuesdays and Fridays from 6.30 to 9 P.M. The hospital contains 60 beds for in-patients. There is an annual out-patient attendance of over 60,000. Minor operations are performed on Tuesdays, Wednesdays, and Thursdays, at 9.30 A.M. Major operations are performed on Tuesdays, Wednesdays, Thursdays, and Fridays, at 10 A.M. Also Thursdays and Fridays at 2 P.M. Practitioners and medical students are admitted to the practice of the hospital at a fee of £5 5s. for three months, £7 7s. for six months, or £10 10s. for perpetual studentship. From amongst the students junior clinical assistants are appointed periodically. For terms and further information apply to the Dean, Mr. Lionel Colledge.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—The practice of the hospital is largely consultative. The hospital is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinique. Systematic Lectures and Demonstrations are given on Tuesdays and Fridays at 4 P.M. An intensive Course of Lectures with demonstration of cases is given from time to time. Consultations on interesting cases take place on the second Wednesday in each month at 4 P.M. Clinical Assistants are appointed and are expected to hold office for at least three months. They are required to attend twice weekly at 1.30 o'clock for the afternoon, and at 4.30 o'clock for the evening Clinics. Full syllabus can be obtained on application to the Dean.

The Metropolitan Ear, Nose, and Throat Hospital.—The hospital is in Fitzroy-square, W. The Out-patient Department is opened daily (Saturdays excepted) at 2.30 P.M. to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Tuesdays, Wednesdays, and Thursdays at 10 A.M. Fee for one month's attendance at the hospital £3 3s., and for three months £5 5s. Clinical Assistants are appointed as vacancies occur, and have responsible duties. Applications should be made to the Secretary, L. L. Phillips.

Royal Ear Hospital.—This hospital is now the Ear, Nose and Throat Department of University College Hospital. All out-patient clinics are now held at University College Hospital in Gower-street, but ward visits and operations by the staff take place each afternoon (except Fridays and Saturdays) at Dean-street.

St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum, City-road, E.C. (Founded 1835.)—The hospital contains for men and women 54 beds. Operations are performed on Mondays, Wednesdays, and Thursdays at 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Average out-patient attendances, 4000 per year. Average in-patients, 675 per year.

St. Peter's Hospital for Stone and other Urinary Diseases, Henrietta-street, Covent Garden. Established 1860. New Hospital opened 1882.—The hospital contains 30 beds for men and 2 beds for women and children. Medical practitioners and students are invited to the clinical instructions which are given in the wards and out-patient department daily, and to the operations in the theatre on Mondays at 2.30 P.M., and Wednesdays and Fridays at 2 P.M. Average beds occupied daily, 30; average out-patients seen daily, 100.

St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C. 2.—The in-patient department, 40 beds, is at 262, Uxbridge-road, W. 12. The out-patient practice is open to the medical profession every day at 2 and every evening (except Saturday) at 6. At all clinics demonstrations on the different diseases presenting themselves are given. Venereal Diseases, under the Government scheme, are admitted at all clinics. The X ray Department is open on Monday, Tuesday, Thursday, and Friday afternoons. The Chesterfield Lectures are given on Thursdays at 6 P.M., October to March, commencing Oct. 11th. At the end of the course the Chesterfield medal may be competed for by those who have attended three-fourths of the lectures. Special laboratory courses in Pathology and Bacteriology of the Skin may be arranged for.

London Lock Hospital and Home (Founded 1746).—In the Institution at Harrow-road, W. 2, there are 202 beds, and 616 in-patients and 8550 out-patients were dealt with in 1922. In the Male Department and Out-patient Department in Dean-street, Soho, W., there are 42 beds, which during 1922 accommodated 372 patients. 81,243 out-patients were treated. 3301 injections of substitutes for salvarsan, &c., were made in 1922. Male patients are seen at 91, Dean-street on Mondays and Tuesdays from 1 to 2 P.M., and from 6 to 8 P.M.; on Wednesdays from 6 to 8 P.M.; on Thursdays, 1 P.M. (male out-patients), 5 P.M. (female patients); on Fridays from 5 to 7 P.M. (male patients); and on Saturdays from 2 to 4 P.M. (males). Pathological Department, daily at 6.30 P.M. Intravenous injections are given at every clinic at 91, Dean-street, W. 1. Female patients are seen at 283, Harrow-road, Paddington, on Mondays, Tuesdays, Wednesdays, and Thursdays at 2 P.M. to 3 P.M., and irrigations are given every evening from 5 to 8 P.M. Irrigations for males are given daily 8 to 10 P.M. For females Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 11 A.M. to 1 P.M., at 91, Dean-street. The next Special Course of Lectures will be held in October. Secretary, Henry J. Eason, Head Office, 283, Harrow-road, W. 9.

ENGLISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

Under this heading we include all the hospitals which are recognised by the English Royal Colleges for a part of the required attendance on medical and surgical practice, for medical clerkships, and surgical dresserships. The list includes nearly every hospital of a general character in the country having more than 150 beds, though occasionally a large hospital is omitted because equally good opportunities are afforded to students at other institutions in its neighbourhood, while a small hospital may be included because no such facilities for study are present elsewhere. The list is arranged alphabetically as to the town where the hospital is located. Most of the larger general hospitals of the kingdom have already been noticed in connexion with the Universities.

Bath Royal United Hospital, Bath.—This hospital contains 134 beds, and possesses X ray, Massage, Bacteriological Departments, a new Pathological Laboratory, and a fine library. Secretary: Mr. J. M. Sheppard. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), from 5 to 7 p.m., and Ear, Throat, and Nose Clinics on Thursdays, at 4 p.m.

Bedford County Hospital, Bedford.—This hospital has 100 beds, with X ray and Pathological Departments, paying wards for 15 beds, and a convalescent home (20 beds) at Aspley Heath, near Woburn Sands, in connexion with the institution. The hospital is approved by the University of London for the purposes of the M.D. and M.S. Examinations. Secretary: Mr. Beauchamp Wadmore.

Bradford Royal Infirmary, Bradford. — This hospital contains 215 beds. The material passing through the surgical wards consists of major operations, chiefly abdominal, and gynæcological work, and affords excellent facilities for either students or post-graduates. There are special clinics for Orthopædic and Venereal cases. Plans for a new hospital of 382 beds have been adopted, and building operations will be commenced as soon as funds will allow.

Royal Sussex County Hospital, Brighton (225 beds).—This hospital affords ample facilities for students, possessing a large out-patient department, including Ophthalmic, Dental, Dermatological, Gynæcological, X ray, and Orthopædic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years, on payment in advance of a fee, not exceeding 20 guineas, as the Board of Management shall direct.

Kent and Canterbury General Hospital, Canterbury.—The hospital contains 115 beds. Pupils of the staff are admitted to the practice of the hospital. Operations four days of the week. There is an Ophthalmic Department with two wards for in-patients, a Venereal Clinic, an Orthopædic Department, &c. Secretary, Mr. F. P. Carroll.

Coventry and Warwickshire Hospital, Coventry (established 1840).—This hospital contains 241 beds, and a new wing as well as theatre and kitchens have been added. Special clinics are held for diseases of the Eyes, Ears, Nose and Throat; Gynæcology; X ray and Electrical Treatment. There are also V.D. Clinics. Clinical students are received, and there are paying wards. Secretary: Miss R. Hooper.

Derbyshire Royal Infirmary, Derby.—This hospital contains 320 beds. It was founded in 1810, and was entirely rebuilt and enlarged 1892–1915 on the most modern lines at a cost of over £144,000. There is a separate ophthalmic block of 33 beds, a separate children's block of 34 beds, and a special department for gynæcological cases. There are four resident house surgeons, a resident house physician, and an assistant house surgeon and casualty officer. There are also well-equipped orthopædic, X ray, electrical, and venereal diseases departments. Registered medical students are admitted to witness the medical and surgical practice on payment of 10 guineas annually.

Royal Devon and Exeter Hospital, Exeter.—The hospital contains 225 beds (including special children's wards) and has a good library, museum, post-mortem room, and pathological laboratory. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. For particulars as to fees, &c., apply to the Matron. A new wing was added in 1897 and the "Victory" wing for the treatment of discharged disabled soldiers and sailors completed and opened in 1922. Arrangements may be made by which gentlemen in practice desiring to increase their qualifications may have the use of the museum and library and other facilities and by which students may attend midwifery. A new Operating Theatre was opened in 1906 (the gift of Mrs. Nosworthy of Newlands, Dawlish, Devon). The Electrical Treatment Department (the gift of Mrs. M. A. Sanders) was opened in 1907 by Lady Duckworth-King. A department was opened in 1917 for the treatment of genito-urinary diseases; there are three sessions per week, two for men at 3 p.m. and 7 p.m., and one for women at 3 p.m.

West of England Eye Infirmary, Exeter.—Secretary: Mr. W. W. Beer. The infirmary contains 64 beds. Students of the Exeter Hospital can attend the practice of the Eye Infirmary. Patients for the year ending Michaelmas, 1922, 3288. A ward is set aside for newly-born babies suffering from infectious eye diseases. The mothers are accommodated with their babies.

Gloucestershire Royal Infirmary and Eye Institution, Gloucester.—This hospital, which was granted the title of "Royal" on the occasion of King Edward VII.'s visit to Gloucester in the year 1909, has 140 beds. Secretary: G. Hurford. In-patients, 1526; out-patients, 8281. An electrical and massage department has been established and venereal clinic opened. Also ear, nose and throat department and X ray Department.

North Staffordshire Infirmary, Hartshill, Stoke-on-Trent.—The New Infirmary, opened in 1869, is built on the pavilion plan, has accommodation for about 304 patients, including Children's wards, and a special department for the treatment of Diseases of the Eye, a special X Ray and Electrical Department, a special department for the treatment of Diseases of the Ear, Nose, and Throat, a special orthopædic department, and venereal diseases clinics, so that there are excellent facilities for acquiring a practical knowledge of the profession. During the last six years the sum of £35,000 has been spent on new buildings and alterations. A new Out-patient Department, costing £12,000, a new Children's Ward of 30 beds, a new Pathological Department, and a second large Operation Theatre are amongst the structural improvements already completed. The whole institution is now equipped in a thoroughly up-to-date manner. Secretary and House Governor: Mr. W. Stevenson.

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NOTTINGHAM GENERAL HOSPITAL.—There are at this hospital 310 beds available for medical and surgical patients, and 46 beds are in the detached ward known as "The Cedars" Convalescent Hospital. The Medical and Surgical Staffs consist of two Honorary Consulting Physicians; 2 Honorary Consulting Surgeons, 1 Honorary Consulting Physician in Venereal Diseases; 3 Honorary Physicians; 4 Honorary Surgeons; 2 Honorary Assistant Physicians; 2 Honorary Assistant Surgeons; 2 Honorary Aural Surgeons; 1 Honorary Dermatologist; 2 Honorary Anæsthetists; 1 Honorary Surgeon Dentist and 1 Honorary Medical Officer in Charge of X ray and Electro-therapeutic department. The Resident Medical Staff consists of 2 House Physicians, 4 House Surgeons and 1 Casualty Officer. The special departments are the Ear, Nose and Throat, Skin, Dental, Massage and Exercise, X ray, Orthopædic, Electro-therapeutic. House Governor and Secretary: Mr. P. M. MacColl. Assistant Secretary: Mr. John S. Birbeck.

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WORCESTER GENERAL INFIRMARY, Worcester.—This hospital has 132 beds (temporarily reduced to 70). Pupils are taken by members of the Honorary Medical and Surgical Staff. Number of operations last year 930. New X ray and Electrical and Wolfram Arc Light, and Ear, Nose and Throat Departments have been erected and are now in use. Additional accommodation for the Honorary Staff and Out-patients and also an Outdoor Shelter in connexion with the Children's Ward have been built as a memorial to King Edward VII. In-patients, 1107; out-patients, 3587. Secretary: Mr. E. J. Holland.

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Bath Royal United Hospital, Bath.—This hospital contains 134 beds, and possesses X ray, Massage, Bacteriological Departments, a new Pathological Laboratory, and a fine library. Secretary: Mr. J. M. Sheppard. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), from 5 to 7 P.M., and Ear, Throat, and Nose Clinics on Thursdays, at 4 P.M.

Bedford County Hospital, Bedford.—This hospital has 100 beds, with X ray and Pathological Departments, paying wards for 15 beds, and a convalescent home (20 beds) at Aspley Heath, near Woburn Sands, in connexion with the institution. The hospital is approved by the University of London for the purposes of the M.D. and M.S. Examinations. Secretary: Mr. Beauchamp Wadmore.

Bradford Royal Infirmary, Bradford.—This hospital contains 215 beds. The material passing through the surgical wards consists of major operations, chiefly abdominal, and gynæcological work, and affords excellent facilities for either students or post-graduates. There are special clinics for Orthopædic and Venereal cases. Plans for a new hospital of 382 beds have been adopted, and building operations will be commenced as soon as funds will allow.

Royal Sussex County Hospital, Brighton (225 beds).—This hospital affords ample facilities for students, possessing a large out-patient department, including Ophthalmic, Dental, Dermatological, Gynæcological, X ray, and Orthopædic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years, on payment in advance of a fee, not exceeding 20 guineas, as the Board of Management shall direct.

Kent and Canterbury General Hospital, Canterbury.—The hospital contains 115 beds. Pupils of the staff are admitted to the practice of the hospital. Operations four days of the week. There is an Ophthalmic Department with two wards for in-patients, a Venereal Clinic, an Orthopædic Department, &c. Secretary, Mr. F. P. Carroll.

Coventry and Warwickshire Hospital, Coventry (established 1840).—This hospital contains 241 beds, and a new wing as well as theatre and kitchens have been added. Special clinics are held for diseases of the Eyes, Ears, Nose and Throat; Gynæcology; X ray and Electrical Treatment. There are also V.D. Clinics. Clinical students are received, and there are paying wards. Secretary: Miss R. Hooper.

Derbyshire Royal Infirmary, Derby.—This hospital contains 320 beds. It was founded in 1810, and was entirely rebuilt and enlarged 1892–1915 on the most modern lines at a cost of over £144,000. There is a separate ophthalmic block of 33 beds, a separate children's block of 34 beds, and a special department for gynæcological cases. There are four resident house surgeons, a resident house physician, and an assistant house surgeon and casualty officer. There are also well-equipped orthopædic, X ray, electrical, and venereal diseases departments. Registered medical students are admitted to witness the medical and surgical practice on payment of 10 guineas annually.

Royal Devon and Exeter Hospital, Exeter.—The hospital contains 225 beds (including special children's wards) and has a good library, museum, post-mortem room, and pathological laboratory. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. For particulars as to fees, &c., apply to the Matron. A new wing was added in 1897 and the "Victory" wing for the treatment of discharged disabled soldiers and sailors completed and opened in 1922. Arrangements may be made by which gentlemen in practice desiring to increase their qualifications may have the use of the museum and library and other facilities and by which students may attend midwifery. A new Operating Theatre was opened in 1906 (the gift of Mrs. Nosworthy of Newlands, Dawlish, Devon). The Electrical Treatment Department (the gift of Mrs. M. A. Sanders) was opened in 1907 by Lady Duckworth-King. A department was opened in 1917 for the treatment of genito-urinary diseases; there are three sessions per week, two for men at 3 P.M. and 7 P.M., and one for women at 3 P.M.

West of England Eye Infirmary, Exeter.—Secretary: Mr. W. W. Beer. The infirmary contains 64 beds. Students of the Exeter Hospital can attend the practice of the Eye Infirmary. Patients for the year ending Michaelmas, 1922, 3288. A ward is set aside for newly-born babies suffering from infectious eye diseases. The mothers are accommodated with their babies.

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York County Hospital, York.—This hospital contains 170 beds. There are balconies for outdoor treatment, two installations of X ray apparatus, electro-therapeutic and massage department, and clinical laboratory. A Venereal Diseases Clinic is held.

School of the Pharmaceutical Society of Great Britain.—The subjects of the Qualifying examination of the Pharmaceutical Society are:—Part 1: (*a*) Chemistry; (*b*) Physics; (*c*) Botany. Part 2: (*a*) Materia Medica; (*b*) Pharmacy, including Posology and the Translation and Dispensing of Prescriptions; (*c*) the law relating to the keeping, selling, and dispensing of poisons and poisonous substances. Fee, 12 guineas; for each subsequent examination after failure, 3 guineas. The advanced or Major examination (for registration as "pharmaceutical chemist") includes botany, chemistry and were the folds of the peritoneum in his dissecting-room days. Dr. Campbell does not advise the extension of the time period without careful consideration of possible disadvantages, which she enumerates, but concludes that it is inevitable if higher standards of practice are to be expected. In considering the curriculum she notes that the nursing of puerperal women is often less efficient than it should be; in such concentrated training it is easy to neglect the unsensational routine of maternity nursing apart from actual delivery. Antenatal work has also been dealt with too lightly in the past; comparatively few midwives now in practice have had any useful training in this respect, and probably for this reason fail to make full use of the maternity welfare clinics. The feeding, care, nursing, and management of premature or diseased infants are special branches of her profession of which the midwife should also have practical experience. Unfortunately the colleague responsible for her training is not always really qualified to impart such complete equipment. To provide against this possibility, Dr. Campbell suggests the institution of a special certificate for teachers, not necessarily to eliminate the approval of practical midwives in this capacity, but to ensure that a teacher shall have the necessary degree of personal education and a knowledge of more recent developments of midwifery, as well as facilities and equipment for undertaking a 12 months' course of training. The majority of practising midwives, though competent and successful in their work, have not these qualifications; their teaching is still further limited by the possible susceptibilities of their patients, and they cannot afford to risk damaging their own practices by such methods as, for example, systematic antenatal supervision, which might annoy or alienate the women attended. The certificate for teachers would not imply any overstepping of the legitimate functions of a midwife and would, we consider, be an excellent step. Of more doubtful utility is Dr. Campbell's suggestion to register and thus recognise "handy-women." She does not propose that any qualification should be required for registration, but merely that suitable women engaged in maternity nursing should be accepted. Any unregistered woman found undertaking this work would then be liable to prosecution. The only requirements upon which it would be possible to insist in all cases are good character, personal cleanliness and physical fitness, temporary or permanent suspension from the register following proved unfitness in any of these respects. Dr. Campbell does not believe that registration would enhance the status of the handy-woman, but that the inconvenience of being subject to suspension by, say, the inspector of midwives, would act as a discouraging factor on her employment. We have some qualms, however, about her hopeful suggestion that difficulties would not arise over the inspection of unqualified women working directly under a doctor; nor do we anticipate that those fully trained monthly nurses who are not midwives would appreciate being enrolled in the same list as quite untrained women. It is not easy to see how best to relegate the handy-woman to her proper function of home-helper, but though the advantages of registration, as outlined by Dr. Campbell, are not inconsiderable, we do not think this proposal will meet with general approval. A section on the midwife and the public health service concludes an admirable report.

Dr. Andrew Balfour resigns on Oct. 31st his post as Director-in-Chief of the Wellcome Bureau of Scientific Research to take up other important duties. He will be succeeded by Dr. C. M. Wenyon, who for the past nine years has been Director of Tropical Research at the Bureau.

WE regret to announce the death, on Sept. 8th, of Mr. Gustavus Hartridge, ophthalmic surgeon to Westminster Hospital, and gratefully known to many generations of students for a lucid manual on the refraction of the eye.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXVI.

MENORRHAGIA IN YOUNG WOMEN WITHOUT GROSS LESION.

THE menstrual function is governed by internal metabolic changes of which hæmorrhage from the endometrium is but the outward and visible sign. The unseen and little understood metabolic processes naturally tend to be overlooked and the uterus, particularly its mucous lining, regarded as the organ at fault in menstrual disorder. It is curious that while amenorrhœa and scanty menstruation are accepted as due rather to general bodily states, such as malnutrition, anæmia, &c., excessive or painful menstruation is usually ascribed to deviation in the position of the uterus or disease in the endometrium, so that alteration of position and curetting have had an undue prominence in treatment.

It is essential in the first place to make sure of the precise nature of the trouble. Patients often seek advice because their normal habit is in excess of the average and, though perfectly well, think the loss is greater than it should be. Such patients require no treatment; it should be explained to them that their type is natural to them, although above the average in quantity or duration. On the other hand, definite change in the menstrual habit in the direction of excess is an indication of disturbance whether it causes symptoms or not, and the general health and circumstances of the patient call for investigation. If the menorrhagia is a symptom of organic disease, renal, cardio-vascular, or suchlike, the treatment will be that of the primary condition, but the vast majority of cases do not exhibit serious organic disease, and the most common provoking factors are those of a nervous and psychical origin or a change in the mode of life or occupation, as, for example, from a healthy outdoor life in the country to a sedentary occupation in town. Here treatment must consist chiefly in advice on how best to order the patient's present mode of life so as to remove the causes predisposing to her trouble. Unless this can be done no medicinal or other treatment will avail. The shop assistant or waitress on her feet all day in a stuffy atmosphere may obtain some benefit from physical exercise at her off times, if not too tired to enjoy it, from regulation of the bowels and other general hygienic measures, but unless she can continue at work through her periods she will not be able to keep her place. If the menorrhagia persists she must, at any rate for a time, give up work, when probably her natural habit will soon return. Ergot, calcium lactate, and the cotarnine salts are disappointing; generally the most valuable drugs are the bromides, but they are rarely successful unless the patient can rest at the time of the period. Improvement of the physical condition is essential, and the best possible use must be made of the intermenstrual period. The cases that respond most readily to hygienic treatment are those with excessive loss with normal intervals; the troublesome cases are those with shortened clear intervals.

Though less serious in its effects, the type in which a slight discharge—often termed "draining" or "dregs" by the patient—persists after the free loss has ceased is particularly difficult to treat; it is common in nervous women and causes them much mental distress. The continuance of a slight discharge should not be allowed to interfere with outdoor pursuits, and if once the patient can be persuaded to concentrate on her physical condition and not on her ailment, the likelihood of her recovery will be greatly increased. Curetting is rarely of use, but may be tried in those over the age of 25, in whom other measures have failed; the possibility of an intra-uterine polypus or general endometrial hyperplasia makes one curetting worth while, but the factor producing the endometrial overgrowth, if not removed, will sooner or later cause a return of the condition. However, inasmuch as curetting affords an excuse for rest in bed, followed by a holiday, it may be the means of giving the patient a fresh start. Probably a judicious use of this time will do more than the operation itself.

The Endocrine Glands and Menstruation.

In spite of the extensive literature on organotherapy in menstrual disorders, our knowledge of endocrinology is as yet too fragmentary to admit of a rational basis for therapeutics; what is attempted is either empirical or speculative. Dr. H. Gardiner-Hill is now undertaking at St. Thomas's Hospital a study of the menstrual function in gross disorders of certain endocrine glands in the hope that it may lead to recognition of an endocrine factor in the less obvious cases. Apart from the ovaries, where abnormalities of function are difficult to assess, the endocrine glands chiefly associated with menstrual disorder are the thyroid and pituitary. Divergent views still exist as to the nature of this relationship and even as to the type of menstrual derangement likely to occur in gross disorders of these glands. The uncertainty arises partly from the difficulty of excluding abnormalities of other endocrine glands. The disordered menstruation accompanying gross disorders of the thyroid and pituitary glands may, indeed, be independent of a specific action of the hormones concerned, since profound alterations in the general metabolism are also produced. Both menorrhagia and amenorrhœa have been described as accompanying both hyper- and hypo-thyroidism. The general opinion seems to be that, while the majority of cases of Graves's disease show a tendency to diminished menstruation or amenorrhœa, if any irregularity at all is present, the majority of cases of hypothyroidism show a tendency to menorrhagia. The stage at which the condition arises, however, may be a factor of importance. The absence of the thyroid hormone in the cretin is generally held to be responsible for lack of development of the genitalia, and consequent amenorrhœa; if treated, however, the cretin appears to commence menstruation about the average age. Minor degrees of hypothyroidism, especially if the onset is in early adolescence, seem to give rise to early menstruation and a tendency to menorrhagia; at the onset of myxœdema in adults the menstrual tendency seems also to be in the direction of excess rather than deficiency. On the other hand, amenorrhœa is often stated to accompany myxœdema, possibly because myxœdema frequently arises at the time of the menopause, artificial or natural. An important relation undoubtedly exists between the pituitary gland and ovarian function, but how far pituitary disturbance can be a cause of menorrhagia is little known, except that in the early stages of acromegaly with anterior lobe hyperplasia overgrowth of the genitalia with menorrhagia occurs and is soon followed by the opposite phase of decreased sexuality and amenorrhœa.

In gross disturbance of the thyroid or pituitary gland menorrhagia is not usually the most prominent symptom. When, however, menorrhagia is a major symptom and gross thyroid or pituitary derangement not obvious, the possibility of some minor endocrine disturbance should be borne in mind, notably in cases occurring at the physiological epochs, such as puberty, after childbirth, or the menopause, especially if any toxic condition is superadded. If signs of endocrine disturbance are noted, an estimation of the basal metabolic rate provides a valuable indication of the existing state of function of the thyroid gland.

Abnormal conditions of the pituitary gland will usually be accompanied by disturbance of growth and metabolism. The patient's height and weight should be compared with the average normal for her age. Radiographs of the sella turcica should also be taken in doubtful cases, while estimations of sugar tolerance may provide additional evidence of pituitary disturbance.

Organotherapy.

The above factors must all be taken into consideration when considering the likelihood of success of organotherapeutic measures in menorrhagia. Up to the present three organic extracts have been chiefly used with varying results. These are thyroid extract, pituitary extract, and extracts of the corpus luteum. The empirical treatment of excessive, scanty, or absent menstruation by thyroid extract is sometimes followed by the return of normal menstruation, and at the climacteric by diminution of the general disturbances associated with this period of life. Thyroid extract is, however, a powerful stimulant to metabolism in general, and possibly these results are due to a general improvement in nutrition. Basal metabolism estimations would appear to provide the best guide as to the need for, and dosage of, thyroid extract in these cases. It should be tried in small doses, ¼ to ½ gr. at night to start with, and gradually increased as the indications arise. As to pituitary extract, the general opinion seems to be that results are disappointing, and when successful may be due to the well-known local action of pituitary extract on the uterine muscle. The recent work of W. E. Dixon suggests the likelihood of menorrhagia occurring with hyperactivity of the pituitary, and pituitary extracts have been recorded as producing good results in cases where ovarian function is deficient. Extracts of corpus luteum have also been used, chiefly by American observers, on the supposition that one function of the corpus luteum is the checking of the menstrual flow. Good results have occasionally been obtained, but apparently in menorrhagia during later, rather than earlier, menstrual life. Our knowledge of the properties of extracts of corpus luteum, however, is as yet meagre, and their administration is, to say the least, speculative.

Conclusion.

The treatment of these difficult cases may be summed up thus. Reliance must be placed chiefly on general and hygienic management of the patient, especially in regard to removing unfavourable conditions in her life and occupation and promoting good physique; curetting is of little use as a therapeutic measure, and more often required for diagnosis in patients after the age of 25–30 than in younger women. Drugs are rarely of use, except perhaps sedatives when there is nervous and psychical disturbance. The organic extracts are occasionally of use, but further investigation will be necessary before a scientific basis is obtained for their administration.

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Special Articles.

MEDICAL EXAMINATION OF DRUNKEN MOTOR DRIVERS.

WORKING OF THE NEW LAW IN DENMARK.

No one denies that the drunken motor driver is a dangerous nuisance. But to deal with him in a manner that is both effective and fair to all concerned is no easy matter. To fine him or lock him up for a month is often merely to temporise and put off the evil day—the second occasion when his tendency to get drunk may mean the death of one or more of his fellow beings. In this country we seem to be moving towards the rule that the motorist once convicted of drunkenness while driving must lose his licence for ever. This rule has already become law in Denmark, the law of 1918 having been revised in 1921 in such a way that, according to paragraph 34, the motorist convicted of drunkenness while driving may have his licence permanently withdrawn. Paragraphs 32 and 34 of this law of 1921 refer to two degrees of alcohol poisoning—" drunkenness " and " being under the influence of alcohol." As there is, of course, no hard-and-fast line between severe and slight intoxication, it soon became evident to the police in Denmark that, if the new law was to be administered justly and effectively, certain standards and criteria would have to be formulated, and soon after the law came into force they solicited the aid of the Danish Medico-Legal Council. An account of the correspondence which followed and of the practical outcome thereof has recently been given by Dr. J. Fog in *Ugeskrift for Laeger* for August 23rd.

In his letter to the Medico-Legal Council, the chief of police pointed out that the decision whether a motorist is drunk or sober has become a most serious matter since, in the former event, the motorist's career may be permanently terminated. It was therefore felt by the police that in cases of alleged drunkenness in drivers, a medical examination is essential. But the police felt it incumbent on them to point out that examinations for drunkenness by medical men had not been carried out in the past on a uniform system, nor had the wording of the reports of such examinations been invariably clear. Hence the difficulties which the police and legal authorities had had in acting on the reports of medical examiners. It was therefore hoped that the Medico-Legal Council would help to clear up this state of affairs and assist the police in choosing a medical expert who would be at the service of the police day and night. In answer to this appeal from the police, the Medico-Legal Council engaged the services of an alienist, Prof. A. Wimmer, and of a pharmacologist, Prof. J. C. Bock, to help work out a detailed scheme to be followed by a medical examiner called on to investigate an alleged case of drunkenness. In the reply of the Medico-Legal Council to the chief of police, it was pointed out that while definite tests could be devised for distinguishing between drunkenness and complete sobriety, the detection of the slighter degrees of alcohol poisoning was a matter of great difficulty. The Council's proposed tests referred therefore only to the diagnosis of definite drunkenness. These tests, it was pointed out, may be classed under three headings: (1) Chemical examination of the blood and urine; (2) psycho-physical examinations; (3) an ordinary clinical examination. In the case of the arrested motor driver, the Council came to the conclusion that only a clinical examination is necessary in practice, and the following programme was devised as a guide to the examining police surgeon, the scheme being sufficiently detailed for any doctor to carry out the examination to the satisfaction of the authorities.

1. Observe the driver's appearance. Drowsiness, drooping eyelids, relaxed features, congestion of the face and conjunctivæ, sweating, slobbering, disordered dress, and the like should be noticed.
2. Observe his behaviour. Noisiness, silly behaviour, excitation, garrulity, restlessness and other characteristics should be noticed.
3. Is his sense of time and space natural? If it is, say "Yes," if not, repeat his statements.
4. Test his memory. Note if he can remember a couple of addresses, and test his ability to describe something—i.e., how the motor accident happened, or the meaning of a drawing in an illustrated paper.
5. Note his speech: is it thick, nasal, lisping, or stammering? Let him repeat difficult words or read aloud a short notice in a paper.
6. Note his gait. Swaying and ataxia should be noticed, and Romberg's test should be carried out.
7. Test the movements of his hands and also his handwriting, telling him to write his name, age, station in life, and address on a sheet of paper.
8. Note if his pulse is regular and rapid, the condition of his pupils, and his response to painful stimuli.
9. Note if he smells of alcohol.
10. Are there signs of other diseases such as epilepsy and apoplexy?

Dr. Fog was charged with the task of putting this scheme into practice, and he has already examined 50 alleged cases of alcohol poisoning in motor drivers. The account he gives of these examinations shows what an elaborate process the Medico-Legal Council has devised. The average duration of a single examination is about 45 minutes. The medical examiner loses no time lest the condition in which he finds the driver should have changed since his arrest. The interview between the driver and the medical examiner is, as a rule, conducted in the absence of a third person, and the examiner hastens to assure the driver that he, the examiner, is a neutral, unbiased party, anxious only to find out the truth. In the quiet atmosphere of this tête-à-tête meeting, the driver, whose excitation is solely due to an accident and the events following it, soon settles down and carries out the various tests satisfactorily. On the other hand, the drunken driver who has been temporarily sobered by the shock of an accident and the prospect of losing his licence for ever, may at first pull himself together to pass certain tests. But the maintenance of such artificial sobriety for the better part of an hour is an almost impossible task, and if he is really drunk, the driver sooner or later betrays himself.

With regard to the value of the tests devised by the Medico-Legal Council, Dr. Fog has found that the fourth test is very delicate; none of the drivers classified as drunk, and hardly any classified as suffering from slight alcohol poisoning, could pass this test satisfactorily. But the fifth test, which also included sums in arithmetic, was of less value. Two drivers, who were found to be sober, could not pass simple arithmetical tests. Handwriting tests proved of little value, for the handwriting of comparatively uneducated men may be bad, however sober they are. As for the pulse-rate, it was of practically no value. Indeed, the average pulse-rate of the drivers discharged as sober was a little higher than that of the drivers declared drunk or suffering from slight alcohol poisoning. Test 9 was of value only when negative; merely to smell of alcohol is of little diagnostic value. All the three drivers not smelling of alcohol were discharged as sober.

Dr. Fog's classification of his 50 cases brings out some interesting points. All the drivers were men, and the age of 41 of them was between 20 and 39. There were 34 professional chauffeurs, and 16 amateur or private drivers. In as many as 31 cases an examination was required between 8 P.M. and 8 A.M., and in 19 of these cases an examination was required between midnight and 6 A.M. Only 9 of the 50 drivers were discharged as sober. Of the remainder, 11 were classified as drunk, and 30 as suffering from slight alcohol poisoning. It is evident from this interesting paper that, under conditions obtaining in Denmark, the medical examination of a motor driver accused of drunkenness is so elaborate and systematically carried out that there is little chance of a miscarriage of justice.

WHAT DOES THE PUBLIC HEALTH SERVICE DO FOR ME?

DISSEMINATION OF HEALTH INFORMATION IN U.S.A.

THE Federal Public Health Service of the United States of America has issued a series of leaflets intended to be read by the older scholars in upper grade and high schools. It has been prepared to meet the general demand for information in regard to the health work now being done by both National and State authorities. The discussion is in six parts, three being subdivided into two sections each, their average length being about 650 words each. The first part is introductory and its purport may be gathered from the extract below. In the second part we are told what the public health service does for the young, and the work of vaccination, of child welfare organisations, of school examinations, and the like, is described. In the third part precautionary measures in regard to travel are noted; in the fourth part we are informed how the public health service protects from communicable diseases. The fifth part deals with the solution of interstate health problems, including paragraphs on standardisation of special products. In the sixth part some portions of industrial hygiene are emphasised. The following extracts will serve to indicate the scope of the whole.

On the Dissemination of Knowledge.

Dissemination of health information is enormously important. Other countries, of course, disseminate it; but they do it chiefly for professional men, doctors, bacteriologists, and not until recently for the benefit of the "man of the street." The U.S. Public Health Service, on the other hand, addresses all the people. Some very technical publications are especially for the benefit of scientists, but by far the greater part of its publications deal with subjects that interest the everyday man, and with some that interest the everyday youth.

It disseminates information concerning new investigations, new discoveries, and new methods, by means of printed books, newspaper articles, radio broadcasts, public lectures, demonstrations, and school-children. Dissemination by children is very important; for when children learn a thing they can be relied upon to educate their parents.

The task of State health authorities, on the other hand, is to collect vital statistics (records of births, deaths, diseases, &c.); to prevent disease by vaccination, inoculation, and house quarantine of the sick; to supervise drinking water, milk, food, sewers, street sanitation, school sanitation, &c.; to inspect factories, workshops, &c.; and in some States to provide school nurses and school physicians.

Broadly spreading, the U.S. Public Health Service finds out things and the State and local health authorities apply them; though, of course, the State and local organisations find out a good many things and the Public Health Service applies a good many. Whichever way they work, however, they work together and get the maximum efficiency.

Foreign Quarantine.

Most important of the direct work for protection against disease is that of barring foreign diseases from our shores. This was almost the first duty undertaken by the Public Health Service, which was organised 125 years ago under the name of the Marine Hospital Service and charged with the medical and surgical care of merchant seamen. Owing to this duty it was usually the first to discover any disease brought from abroad. From this the Quarantine Service of the U.S. Public Health Service developed.

The States, of course, had control of their ports and at first most of them established their own quarantines. Later, however, it became evident that the National Government was best fitted for carrying out such work; and one after another the States turned over their stations to the Public Health Service. New York, the last, fell in line about two years ago.

Some years ago the quarantine work of the Service was divided into two parts—foreign and domestic. Foreign quarantine has to do with diseases coming from abroad and domestic quarantine with the spread of disease among the States.

The Public Health Service has two lines of defence against foreign diseases, one abroad and the other at home. In all, 77 officers man the first line, 31 in Europe, 2 in South America, 7 in Mexico, 3 in China, 19 in the Philippines and Hawaii, and 15 in Cuba, Porto Rico, the Virgin Islands, and Panama. These officers are stationed at as many sea ports, where they are charged with preventing the sailing for America of emigrants infected with diseases, especially with typhus, cholera, plague, and yellow fever.

In Europe the task has of late years not been easy. The would-be emigrants were mad to get to the United States; and their native countries were for the most part glad to have them go; and some of the steamships were not averse to carrying them, but were averse to spending money for delousing plants, &c. The Public Health Service could not directly compel them to do this, nor could it everywhere do it itself, for some European countries objected on the ground that in setting up the necessary facilities the United States was encroaching on their sovereignity.

The Public Health Service had to counter by requesting the State Department to instruct its consuls in Europe to refuse a bill of health to vessels sailing for the United States with passengers who had not been subjected to cleansing measures and by instructing its own quarantine officers to delouse immigrants on arrival in this country and to detain them, in case of suspicion, for 12 days thereafter. Only by this action were some steamship companies induced to instal disinfecting plants abroad. Aided by the present restrictive immigration law and by the disinfecting and delousing facilities, conditions are now reasonably satisfactory. The restrictive law is, however, until July 1st, 1924, only, and unless it is renewed or in some way replaced the tidal wave of immigrants waiting in Europe for the letting down of the bars will rush for this country at the first opportunity and the resulting pressure will test every timber in the health barricade.

Leprosy.

According to the best estimates there are now in the United States 500 to 1500 lepers, a mere bagatelle compared with those suffering from tuberculosis, which is for that matter far more contagious and far more deadly. Nevertheless, knowledge of the presence of a leper in a street car, for instance, would cause a panic and that of a tuberculous patient could cause scarcely a thrill.

Public opinion has insisted that the Federal Government shall take charge of all lepers, and it has undertaken to do so.

In 1917 Congress provided for a national home for lepers to be administered by the Public Health Service, but so strongly did the various States object to its location within their borders that it was not until four years later that the Service was able to acquire a leper home (in Louisiana). This home is still being enlarged, and each new ward is rapidly filled. The Public Health Service, on application from a proper State authority may accept as a patient at this home any leper found in any State, with the exception of aliens subject to deportation from the country. This protects you in steadily increasing measure against possible contact with lepers who are at large.

Leprosy has been found in a measure amenable to treatment. Nearly one-third of the patients at stations in Hawaii have been released as being no longer a menace to public health, and of these only about one-eighth have relapsed.

Examination of Biological Products.

Some years ago Congress assigned to the Treasury Department operating through Hygienic Laboratory of the Public Health Service the duty of making tests of "biological products" and of inspecting the factories where these "products" were manufactured. No bacteriological product may be shipped in interstate commerce not bearing the indorsement of the Laboratory. This indorsement is, of course, not as to the medicinal value of the product but is merely as to its strength, toxic properties, and the sanitary conditions under which it is manufactured.

Most States have officially adopted the Public Health Service standards; but some still allow the manufacture within their border of products whose manufacturers are unwilling to submit them for testing or their factories for inspection. Such products may not be shipped from State to State.

The Public Health Service has standardised products for use against diphtheria, lockjaw, dysentery, meningitis, pneumonia, and typhoid.

Within the last 20 years the death-rate from diseases now treated by bacteriological products has been enormously reduced. Small-pox, except where vaccination has been neglected, has been almost abolished; meningitis to about one-sixth and diphtheria to less than one-third; rabies, if taken in time, can almost always be prevented; tetanus has been greatly reduced.

Medical Departments in Industrial Plants.

The establishment of medical departments in most of the industrial plants of the country was also in part due to the Public Health Service. Such departments attend not only to employees who are injured in accidents or who are taken sick at the plant, but they also investigate the causes of any disease that breaks out in the plant and eradicates it, thereby making the factory more healthful and reducing absenteeism and the cost of finding new men to replace those who quit. They keep records, too, from which the Public Health Service may work out, as soon as enough are available, a health standard based on the normal or average amount of absence from work on account of sickness. Such a standard is expected to bring about important improvements in factories that find themselves below par.

The effect on the physique and health of industrial workers, especially women, resulting from the monotonous and rapid repetition hour after hour and month after month of movements in themselves light and simple, is now being investigated.

The Public Health Service is of opinion that, so far, though conclusive proof is lacking, it is probable that serious injury may be caused by any work, the performance of which calls for cramped, constrained, or awkward posture. Less certain is the effect of such work on the nervous system. That the constant repetition of a movement does in time affect this system is more than probable, but how importantly it affects it has not been established. This investigation will almost certainly result in great benefits to working women.

VITAL STATISTICS FOR 1921.

THE REGISTRAR-GENERAL'S REVIEW.

THE text of this Review,[1] being one of three volumes comprising the entire survey, is now published one year and eight months after the termination of the year to which it relates, and many months after the publication of the tables which are necessary for complete study of the present volume. It contains the valuable, chiefly medical, commentary on the vital statistics for the year 1921.

A Phenomenally Low Death-rate.—As in the previous year (1920) there was experienced also in 1921 a lower death-rate than in any previous year since 1837, the main explanation of this being a succession of two exceptionally mild winters. Had the death-rate for 1921 been stated in terms of the standard population recommended by the International Statistical Institute it would have been 12·5 instead of 11·5 per 1000.

Comparison of the Two Sexes.—Much interest attaches to the relative mortality of the two sexes at various periods of life for equal numbers living. Reference to Table III. in another volume shows, as pointed out in this report, that prior to 1920 in no year was the death-rate at ages 85 and upwards higher in females than in males, as it was in 1921 (in the proportion of 100 to 95). At ages under 5 in the same year the male death-rate was 25 per cent., at ages 5–10 it was 3 per cent., at ages 15–45 it was 16 per cent., at ages 55–65 30 per cent., at ages 65–75 21 per cent., and at ages 75–85 14 per cent. higher in males than in females. There remains the age-period 10–15, in which male mortality was 3 per cent. lower than that of females, a phenomenon which, with few exceptions, has held good for many years.

Infant Mortality was at the rate of 83 per 1000 births, lower than in any previous year except 1920, when the deaths numbered only 80 per 1000 births. The hot dry summer of 1921 might have been expected to cause a large excess of diarrhœal diseases, but the amount of these diseases was well below the average of all years preceding 1915, though higher than in the more recent years preceding 1921. The valuable tables given on pages 6 and 7 of this Review are worthy of detailed study by all hygienists. They show, inter alia, the error of the commonly accepted statement that the death-rate in the first four weeks after birth has not declined. It was 40·6 in 1911 and 35·2 in 1921, and the variations in different localities were much greater than are indicated by these average rates for the whole country. In the next two months of infancy the death-rate between 1911 and 1921 declined from 24·7 to 14·7, in the third to the sixth month from 25·9 to 13·7, in the next three months from 20·6 to 9·7, and at 9–12 months from 17·4 to 7·8. In another table is shown the influence of urban life on infant mortality. In the first four weeks urban excess over rural was 7 per cent., in the next two months it was 25 per cent., in the third to the sixth month 49 per cent., and in the two next three-monthly periods 44 and 48 per cent. respectively.

The *Regional Distribution of Infant Mortality* has great importance. In the north of England as a whole it was 38 per cent. higher than in the south, an excess which is greater than the excess of infant mortality in county boroughs over that in aggregate rural districts. It is marked even in the first day after live birth (20 per cent.), and it amounts to 34 per cent. in the first four weeks after birth, and there is therefore opened up here a region for investigation by medical officers of health which should bear fruit, especially in improved care of mothers before, during, and after childbirth.

Deaths from Suffocation.—Up to the year 1914 accidental mechanical suffocation had varied little during 30 years. It declined rapidly in 1915 and 1916, and since then has fallen from 1·40 per 1000 births in 1914 to 0·59 in 1921. (To see the progress of events year by year it is necessary to refer to another volume.) Furthermore, while in past years mortality from this cause was much greater in the south than in the north, and especially excessive in London, the decreased mortality is not very unequal in all parts of the country. It is difficult, as is said in the report, to dissociate this change entirely from the war, and the decreased consumption of alcohol at once suggests itself as a possible explanation; though it appears not unlikely that some change may have taken place in the attitude of coroners to suspected cases investigated by them.

Increase of Excess Mortality of Male Infants.—As is well known, male infant mortality is always higher than female. Owing to the fact that comparing, for instance, 1881–90 with 1921 the male infant death-rate has declined only 45, while that for females has declined 48 per cent., the difference between the two sexes is slowly increasing. The excess in the mortality of males is greatest in the earlier months of infancy, and as the recent fall in infant mortality has occurred chiefly in the later months, this in itself explains some of the increased difference between the mortality in the two sexes. In this connexion it is necessary to think of early infant mortality as partly avoidable and partly inevitable, and if it be assumed, as is not unlikely, that a larger proportion of male than of female infantile deaths are in the latter category, it follows that reduction of infant mortality must be associated with an increased difference between male and female infant mortality. A comparison of the cause of events in other countries shows no movement in the opposite direction, although in only a few of the countries whose experience is quoted in the Review is there as large an increase in male excess as in this country.

(To be continued.)

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[1] The Registrar-General's Review of England and Wales for the Year 1921. (New Annual Series, No. 1. Text.) H.M. Stationery Office. 5s.

ROYAL INSTITUTE OF PUBLIC HEALTH.—A course of lectures on Problems of Personal and Public Health will be delivered in the Lecture Hall of the Institute, 37, Russell-square, London, W.C., at 4 P.M. on Wednesdays, beginning on Oct. 17th. Among the lecturers will be Dr. Alfred Greenwood; Prof. J. C. Drummond, Major H. Graeme Anderson, Dr. W. A. Bullough, Mr. William B. Smith, Dr. C. W. Saleeby, Dr. Kate Platt, Dr. A. H. Bygott, and Mr. H. D. Herring.

The Harben Lectures will be given by Prof. C. Levaditi, M.D., of the Pasteur Institute, Paris, on Dec. 11th, 12th, and 13th on: (a) Neurotropic Virus (Encephalitis); (b) Neuro-vaccine; (c) New Discoveries in the Treatment and Prophylaxis of Syphilis.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Health of Belfast.

THE report of Dr. H. W. Bailie, medical superintendent officer of health for the year 1922, has just been issued. The general improvement in the health of the city is shown by the fact that the total number of deaths in 1922, viz. 6304, with a population of 425,000, is less than the number, viz. 6910, in the year 1892, with a population of 261,046, the respective rates being 14·8 per 1000 and 26·5 per 1000. The rate for 1922 shows a fractional increase over the previous year—14·8 compared with 14·4 per 1000. Typhoid fever, which was formerly very prevalent, has almost disappeared. The number of cases was 75 with 7 deaths, a mortality of 9·3 per cent. No case of typhus fever occurred during the year. Scarlet fever was prevalent but in a very mild form. There were 741 cases with 12 deaths, a mortality of 1·6 per cent. Diphtheria was also prevalent. There were 497 cases with 43 deaths, a case mortality of 8·65 per cent. Measles caused 33 deaths, equivalent to a death-rate of 0·08 per 1000 of the population. Whooping-cough caused 16 deaths, equivalent to a death-rate of 0·04 per 1000 of the population. Diarrhœa caused 152 deaths, equivalent to a death-rate of 0·36 of the population; of the total number 127 were children under 2 years of age, and 25 were 2 years of age and upwards. There were 8 cases of cerebro-spinal fever with 3 deaths. Influenza caused 241 deaths. Phthisis caused 624 deaths, a rate of 1·5 per 1000. Pneumonia caused 594 deaths, a rate of 1·4 per 1000. Cancer caused 363 deaths, a rate of 0·9 per 1000. There was a reduction of 0·8 per 1000 in the death-rate from zymotic diseases, and an increase of 0·4 per 1000 from chest affections compared with the previous year. The birth-rate was 25·1, a decrease of 1·2 compared with the previous year. Infant mortality was 94 per 1000, or 21 per 1000 less than the previous year. The natural increase of the population was 4363. At the out-patient clinics for venereal disease 2376 cases were treated, and 420 patients received treatment as in-patients. The total cost of treatment of persons suffering from venereal diseases was £6544 5*s.* 8*d.*, of which 75 per cent. of the cost incurred was recouped to the corporation. The number of houses disinfected during the year was 1882. Five maternity and child welfare centres were in operation. The number of names upon the rolls was 24,287. Of 16,503 cows slaughtered during the year 35, or 0·21 per cent., exhibited lesions of disease in the udder; 12·33 per cent. of cows were found to be tuberculous.

Belfast District Asylum.

Dr. N. B. Graham's report for the year 1922 shows that the number of patients was 975, males 466, females 509. Discharged patients numbered 141, of whom 78 were cured. There were 74 deaths. Of these, 17·5 per cent. were due to general paralysis of the insane, 16·2 to phthisis, 14·8 to cerebral softening. As regards causation, the most potent factor was found to be a faulty heredity, the other chief causes being mental stress, critical periods, and syphilis. In only 2·6 per cent. of the admissions was alcoholic excess considered to be the principal cause of the insanity, but in 10·9 per cent. it was believed to be a contributory cause. A large increase in the accommodation for patients is in progress. Dr. Graham complains of the present state of the Lunacy Laws.

> "It is illegal to receive as 'voluntary' boarders early uncertifiable mentally afflicted patients, also certifiable harmless patients, who are willing to submit to such treatment, without certification. If the Lunacy Laws were amended to meet such conditions, the stigmata of certification, so much dreaded by patients and their relatives, would be removed; they would, therefore, be advised and encouraged to submit to such treatment, and so facilitate early recovery."

The Government of Northern Ireland may be expected shortly to deal with this important matter. It is a feature of the asylum, which is situated in a spacious park some miles from the city, to encourage work amongst the patients. About 60 per cent. of the patients are regularly employed, many of them in agricultural work, and this is found to be very beneficial. The asylum is on the villa system which has proved most satisfactory.

Tuberculosis in Belfast.

The annual report of Dr. A. Trimble, chief tuberculosis officer, shows that the death-rate from pulmonary tuberculosis for the year 1922 was 1·5 per 1000. This represents a reduction of 45 per cent. as compared with the year 1918, and a reduction of 68 per cent. as compared with the year 1890. A similar fall occurred in the death-rate from non-pulmonary forms of tuberculosis. The influence of housing is shown by the fact that in 62 per cent. of the new cases examined the conditions were reported as under average. The analysis of occupations shows the relatively large number of cases occurring in clerks, engineers, spinners, stitchers, reelers, winders, doffers, labourers. Discharged soldiers showed a high proportion. It is noteworthy in view of the staple trade of Belfast that flax-dressers and other branches of the trade showed a moderate ratio amongst males and a rather high ratio amongst females. The female rate in general continues to show a considerable excess over the male rate. In 42 per cent. of cases the patients were found to have had personal association with infected persons. The rate amongst new patients varied in the different wards of the city from 5·6 per 1000 of the population to 1·5 per 1000. The proportion of pulmonary, as compared with non-pulmonary cases, was 75 to 25. The open-air school for children living in contact with tuberculous cases has been attended with great success. Sanatorium, dispensary, and domiciliary treatment is pursued.

Public Health Services.

MENTAL HOSPITALS SERVICE.

NINE recently published reports of county and borough asylums[1] offer examples of certain changes which are slowly becoming general. The removal of adverse conditions produced by the war is evidenced by an improved state of general health in the patients and lower death-rates—in particular, deaths from tuberculosis and the numbers of active cases of this disease are both fortunately diminishing. Dysentery also appears to be less common, and several outbreaks of enteric fever recorded appear to have been traced promptly to their source and kept within very narrow limits. The improvement in the patients' health is attributable in part to a more liberal diet. Dinner appears to be a universally satisfactory meal, but the all too familiar and oft-repeated suggestion in the commissioner's report that breakfast and tea should be made less monotonous is still to be found in most of these publications.

Another change, exhibited in greatly varying degree, is a response to the demand for efficient medical treatment in cases of insanity. Visiting dentists are now almost universal, although in some cases their hours of attendance can only allow of treating the most flagrant cases of dental sepsis among the patients. Surgeons and other consultants have been appointed in some cases, and at Hill End (Hertfordshire) an operating theatre has been built, and at Nottingham a pathological laboratory.

The constitution of mental hospital staffs is not apparently sharing in the general trend of progress towards greater efficiency. The junior posts in this service remain ill-paid, and open only to bachelors, and the proportion of physicians to patients remains in many cases undesirably low. At Barming Heath (Kent), for example, the post of second assistant medical officer is again vacant, as recorded in last year's report. At Chichester the post of third assistant medical officer is not only vacant, but intended by the committee to remain so indefinitely, one result of which, as pointed out by the commissioner, is that bacteriological and other laboratory work is at a complete standstill, and a well-equipped laboratory is unused. The most astonishing example of this policy (for it appears to represent an actual policy of staff reduction in some cases) is to be found at Carmarthen. Here the second assistant medical officer has had notice to terminate his services, and an institution containing nearly 600 patients is in future to be administered by the medical superintendent and one other medical officer. At the same time the number of nurses has been reduced, and their hours of service increased to 66 per week. To quote the commissioner's report:—

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[1] Annual Reports of the Brighton County Borough Mental Hospital, of the Kent County Mental Hospitals, of the Hertfordshire County Mental Hospital, of the Nottingham City Asylum, of the Monmouthshire Asylum, of the Joint Counties Mental Hospital, Carmarthen, of the West Sussex County Mental Hospital, of the Asylums Committee, City of Birmingham, and of the Down District Lunatic Asylum, Downpatrick.

> "How all the work is to be efficiently carried out, not forgetting the lectures for the nursing staff, and due relaxation is to be afforded it is difficult to see. I trust the question will be reconsidered, and that the committee may feel their way to abandoning this step, as well as the reduction of the nursing staff by 14 (and that contrary as it appears to the advice of the medical superintendent) at a time when so much is being said as to the necessity for, if possible, more systematic and individal treatment in mental disease. As to the reduction of the nursing staff, I will only point out that during my inspection to-day I noticed one female ward, number 5, with 27 chronic, noisy, troublesome cases, with but one nurse, the result, I was informed, of the reduction which has already taken place."

The only reference to these remarks in the report of the committee of visitors is a formal record of the visit, the authors of which have the effrontery to declare that the commissioner "reported that all the patients appeared to be in receipt of due supervision and care." The purpose of this painful euphemism is difficult to discern.

Nottingham and Hertfordshire have given leave of absence on trial to a number of cases, in some of which money allowances were made. The neglect of this procedure receives comment in other reports, notably in that of Carmarthen, where apparently no patients whatever were given such leave.

Chichester records a wonderfully low death-rate, of only 2·38 per cent. A small outbreak of enteric fever evokes comment on the methods of handling foul linen, which apparently "differ somewhat on the male and female sides." An interesting after-comment on the Committee of Inquiry into the Administration of Public Mental Hospitals is to be found in a paragraph referring to a late patient at Chichester who gave evidence at that inquiry: "A letter has recently been received from the ex-patient himself, retracting his allegations and apologising for the statements, which, he says, were made owing to a morbid mental state." It is unfortunate that this letter cannot be given wider publicity.

The reports of the Downpatrick and Birmingham asylums are of unusual interest, both for the readable material and full information which they provide, and the former particularly for its numerous photographic illustrations. Great changes have taken place at Birmingham. Rubery Hill and Hollymoor, until recently leased by the Ministry of Pensions, have been taken over again, and "no less than 810 patients have been transferred from institutions situated outside the city as far apart as York and Hampshire without accident." Great improvements have been made in the buildings, and their equipment now includes clinical laboratories, examination rooms, operating and dental room, hydrotherapeutic room, and research laboratories. These were referred to in reporting the inaugural ceremony of the Joint Board of Research in Mental Disease. A bridge which will shortly be complete will unite the Rubery and Hollymoor estates, and "provide about three miles of varied exercise track, with rustic seats in certain wooded spots." Perhaps the most arresting feature of this report is an exhaustive analysis, on original and up-to-date lines, of the ætiological factors assigned in the 147 direct admissions of the year. These observations deserve wider publicity.

One or two of the reports under review yield practically no information whatever beyond what can be found in their statistical tables. It still appears to be incumbent on some medical superintendents to record the condition of crops and cattle, and repairs to boilers or drains. Admittedly the state of the fabric of an asylum, and every sort of function performed by everyone connected with it, have some bearing on the patients' welfare, and should be under the medical superintendent's control, but why he should be called upon to describe such activities as these rather than discuss the mental welfare of his patients in a report which in any case is usually all too brief is difficult to understand.

SCHOOL MEDICAL SERVICE.

Hertfordshire.

The number of children inspected was 13,509, and the percentage with defects 32·1. Enlarged tonsils accounted for 5·8 per cent., enlargement of submaxillary and cervical glands 3·8 per cent., and malnutrition 1·3 per cent. Schools were closed on 181 occasions compared with 46 closures in 1921, the increase being due to influenza, colds, and measles. The four orthopædic centres of the Herts branch of the British Red Cross Society which were organised by Mr. R. C. Elmslie, orthopædic consultant to the London County Council, have been in full working order for one year, and the results obtained have been very satisfactory. Dr. Hyslop Thompson reports that the centres have supplied a long-felt want in the county, and the improvement in many cases is very marked. The following are the cases dealt with:—

—	Males.			Females.		
	Under 5 years.	Under 14 years.	Over 14 years.	Under 5 years.	Under 14 years.	Over 14 years.
Paralysis	9	18	3	6	12	3
Bone defects ..	14	7	1	15	9	1
Spinal curvatures	0	9	1	0	15	8
Joints	0	2	1	3	0	4
Injuries	0	5	10	1	4	8
Miscellaneous ..	6	12	6	8	13	14
Totals	29	53	22	33	53	38
Both sexes ..	62	106	60	—	—	—

Norfolk.

During the year 13,698 children were examined in the routine groups. In addition, 2111 special inspections were made and 8427 children were re-examined. About 1 per cent. suffered from malnutrition, and Dr. J. T. C. Nash refers the decline in the number of these cases as being eloquent of the better conditions for farm labourers prevailing during the past few years, but is dubious of the improvement being maintained owing to the recent fall in wages. Cleanliness has improved with the exception of certain families which will always be "impossible." Refraction clinics were held at 97 centres and four dental vans equipped for inspection and treatment are employed by four dentists, 78 per cent. of the 18,270 children seen being referred for treatment, and about one-third of these taking advantage of the authority's scheme. There were 2305 school children excluded from school under Article 45(B) for infectious disease, 148 of these for influenza.

Forty-seven children received institutional treatment for definite or suspected tuberculosis, seven of these being of the non-pulmonary type. In addition 79 children were under domiciliary treatment. At the end of the year there were 28 cases still in institutions and 75 under domiciliary treatment. Dr. Nash is of opinion that, although sanatorium treatment is expensive, money is well spent in preventing the onset of definite clinical tuberculosis, and he considers that the nearer schools approach the open-air type the better, and suggests that less money might be spent on bricks and mortar and more on asphalted playgrounds, clothing, and food. "At the present time children, often poorly fed and inappropriately clothed, with defective footwear, have to sit for the best part of two hours in winter with cold, wet feet in rooms at a temperature under 50° F. in many schools. Is it to be wondered at that catarrh is common and that the children are too miserable to benefit fully from the instruction?"

One of the school dentists, Mr. Millican, contributes an interesting report on jaw deformities. He finds that children born and living on high sites or on the sea-front are freer from jaw or palatal deformity than children on low and damp sites, and he places the "locality" as the chief determining cause of jaw deformity.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. R. H. St. B. E. Hughes to *Excellent*; F. G. H. R. Black to *Pembroke*, addl., for Chatham Dockyard, temp. Surg. Lt.-Comdrs. W. H. Sinclair-Loutit, R. Buddle, P. N. Button, W. J. Morris, J. F. Pace, J. F. M. Campbell, M. B. Macleod, and G. W. Woodhouse to *President*, addl., for five months' course of instruction at R.N. College, Greenwich. F. C. Wright to *Pembroke*, for Chatham Dockyard; and G. L. Ritchie to *Impregnable*. Surg.-Lt. R. W. Higgins to *Queen Elizabeth*.

ROYAL NAVAL VOLUNTEER RESERVE.

The following late Temp. Dental Surgs. have been transferred to the permanent list as Surg.-Lts.: T. P. Cooper, G. W. E. Holloway, A. G. D. Pridham, D. C. Lamond, E. G. Parkinson, G. R. D. Hankinson, and A. C. Bloomer.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Cols., late R.A.M.C., retire on ret. pay: J. B. Anderson, on account of ill-health contracted on active service; R. J. Blackham from half pay.

The undermentioned Capts. are seconded for service with the Egyptian Army: D. C. Bowie, J. C. Collins, and J. J. Magner.

Temp. Capt. N. Leonard relinquishes his commission and retains the rank of Capt.

TERRITORIAL ARMY.

Capts. W. M. Wilson and E. W. Herrington having attained the age limit are retd. and retain the rank of Capt.

Lt. (Temp. Capt.) F. J. Cleminson relinquishes his commission and is granted the rank of Capt.

Capt. N. M. Fergusson to be Maj.

S. McC. Kirk to be Lt.

General Hospitals: Lt.-Col. Sir E. J. Maclean having attained the age limit is retd. and retains the rank of Lt.-Col.

The undermentioned relinquish their commissions and retain their rank, except where otherwise stated: Majs. E. C. Bevers and F. C. Pybus; Capts. H. M. Clarke, P. H. Green (granted the rank of Maj.), and J. A. Gunn.

Sanitary Companies: Capt. H. Duguid relinquishes his commission and retains the rank of Capt.

INDIAN MEDICAL SERVICE.

Majs. E. C. Hodgson, W. Gillitt, C. H. Barber, W. Tarr, H. Watts, I. D. Jones, W. T. Finlayson, W. T. McCowen, H. E. Stanger-Leathes, J. M. Holmes, and M. F. White to be Lt.-Cols.

The King has approved the admission of the following: J. H. Barrett, G. H. Fraser, and T. H. Thomas to be Capts.

Messrs. William Heinemann (Medical Books), Ltd. announce the early appearance of "High Blood Pressure: its Variations and Control," by Dr. J. F. Halls Dally; "Pneumonia," by the late Dr. Robert Murray Leslie, edited, revised, and brought up to date by Dr. J. Browning Alexander; and "Manual of Practical X Ray Work," third edition, by Dr. John Muir, B.Sc., in collaboration with Sir Archibald Douglas Reid.

Correspondence.

"Audi alteram partem."

BLOOD-DONORS.

To the Editor of THE LANCET.

SIR,—On the evening of Sept. 3rd a broadcast appeal for volunteers to act as blood-donors was sent out from King's College Hospital. The response was generous, the group-tests were done on the 4th, one suitable donor was selected, and the operation of transfusion arranged for the 5th. There the affair ends as far as the public is concerned. Expert criticism is disarmed by the statement that "the others have been classified for possible future emergencies."

One cannot help wondering how many of our hospitals find themselves in a similar state of unreadiness as regards blood-donors; nor can the reflection be avoided that in the majority this defect of organisation could be easily remedied. About six months ago, having need of a donor to give blood to a case of hæmatemesis (from gastric ulcer) I was fortunate enough to find at hand a known No. 4 volunteer; the transfusion was done at once, and the patient recovered. Realising that fortune is a fickle jade, I determined to make provision against a similar emergency, and to that end asked for volunteers amongst the employees of the Great Western Works, who number nearly 15,000, at Swindon. The response was generous; Dr. Knyvett Gordon came down and tested about 50 volunteers during one afternoon. At some convenient time in the near future another batch will be tested, but already, secure in the knowledge that at least a dozen No. 4 donors, of good physique and sound constitution are available at any moment, I have no anxiety now on this matter.

On two occasions since then I have been glad that this organisation existed, but the real criterion came on July 24th last when a man, aged 52, was struck by the flying fragment of a broken cutting tool in the left groin at the G.W.R. Works. Arterial blood cascaded from the deep wound inflicted. Two of his fellow workmen, trained in ambulance work, with commendable promptitude and efficiency controlled the femoral at the brim of the pelvis for 20 minutes, during which time, on an improvised operating table, and under ether, I was able to tie the external iliac artery. That being safely accomplished I enlarged the wound and tied the proximal and distal ends of the femoral and the severed profunda femoris. So far the account is not of special interest, and the replica could be furnished from hundreds of large works and hospitals. But as the last dressing was applied a workman approached me and asked, "Are you needing a No. 4 donor, because if you are, there is one ready waiting."

It is true that a large works offers ideal facilities, but there should be no insuperable difficulties in the way of applying the principle with varying degrees of perfection according to the conditions obtaining throughout the country. The factor of expense cannot be neglected. It is essential that the tests be made by a pathologist of experience; at the same time a Wassermann test can be done, and an adequate physical examination carried out. Every volunteer should receive a card stating his blood-group, and a record should be kept at the hospital of his address, &c. If the investigation be made of "batches" the expense is trifling. It is remotely possible that the Ministry of Health may consider the project worthy of consideration.

I am aware that efficient provision has been made for this contingency at certain hospitals; I have in mind, however, the organised registration of donors drawn from large works or other more or less stable communities.

I am, Sir, yours faithfully,

H. H. GREENWOOD, B.S. Lond., F.R.C.S. Eng.,
Consulting Surgeon, G.W.R. Hospital; Hon. Surgeon,
Sept. 7th, 1923. Victoria Hospital, Swindon.

A MEDICAL AND NURSING SERVICE IN RURAL MANITOBA.

To the Editor of THE LANCET.

SIR,—I think your readers will be interested in a brief account of a combined medical and nursing service organised for rural areas by the Manitoba Division of the Canadian Red Cross Society, especially as it has been of tremendous assistance to many British-born settlers whose wives in many cases have come directly from the Old Land to live in what are known as the unorganised areas of Manitoba. It illustrates also the value of the whole-hearted coöperation of the medical profession with the Red Cross peace-time service.

In 1919 the Red Cross Society, finding a great and urgent demand for some sort of skilled assistance in dealing with the health of certain districts which had no other civilised social service, established at Reynolds, where Poles and Ruthenian settlers abound, 63 miles east of Winnipeg, Fisher Branch, 72 miles N.W. and Grahamdale, 134 miles N.W. (both points lying between Lakes Winnipeg and Manitoba), and also at Kinosota, 140 miles N.W., on the west side of Lake Manitoba, nursing stations, which were at first disciplined and managed by the Provincial Board of Health but now are under the exclusive management of the Red Cross Society with its Medical Advisory Board. These nursing stations proved of great value, but it soon became apparent that medical supervision was needed and that too great a responsibility was being placed on nurses whose calling does not include the ability to diagnose and to decide the final destination of any given case. It must be remembered that these districts, except Reynolds, were 40 miles at least from the nearest doctor and that very few of the people could afford to pay any fees. The problem was how to cover the ground effectively. For most of the year the roads are only passable by foot or horse-drawn vehicles, and not always thus. Bush country in unorganised Manitoba is always very boggy in spring and often in summer; in winter snow may block the trails. At the request of the Red Cross Society the Winnipeg Medical Society appointed an advisory committee of five doctors who had had a wide experience of rural conditions in Manitoba, under the chairmanship of one of the leading surgeons. After examining such propositions as the organisation of a travelling hospital the medical committee declared itself in favour of appointing a medical officer to the Unorganised Areas Service, who should be paid an ample salary with free transport, give full-time service without other remuneration, and make Winnipeg his headquarters, whence he should visit in turn or as occasion demands these or other nursing stations established by the Red Cross Service. This recommendation was adopted and financed entirely by the Red Cross Society, with the exception that the Winnipeg Medical Society presented the service with the necessary outfit of instruments for midwifery as well as for medical and surgical purposes. Since the fall of 1920 a succession of well-trained young medical men have manned this service to the great comfort and support of the nurses and to the relief of hundreds of settlers and their families.

Here I would like to emphasise the splendid services of our nurses, many of whom have been trained in the Old Country and have proved the value of their training for the C.M.B. diploma when handling the inevitable midwifery perforce single-handed and under difficult conditions. As an eloquent sample of the appreciation of this service to unorganised areas the following is a quotation from a recent letter to the present writer:—

"The Red Cross people have done a great work here. It is so comforting to us to have the nurse near us and the doctor's monthly visits. This spring the trails have been awful; the land is too wet to seed and now the meadows are too wet to cut the hay. Our post office is 3½ miles away but we have to go about seven miles to get there! Nurse has done fine work since she came here; has visited hundreds in all kinds of weather by land and lake; has been caught in storms and tumbled into snow-drifts, stuck in sloughs, and got lost on several occasions in happy ignorance of the danger! Few nurses would have gone through it, cold and hungry many a time, and no complaints, night and day. In fact she has had as many escapades as St. Paul!"

This is not exaggerated, and refers, of course, only to the unorganised parts of Manitoba. My committee consists of Dr. Jasper Halpenny (chairman), Drs. N. W. Warner, G. S. Fahrni, T. C. Brereton, and myself.—I am, Sir, yours faithfully,

H. M. SPEECHLY, M.R.C.S. Eng.,
Hon. Secretary, Medical Advisory Committee.
Winnipeg, August 22nd, 1923.

PATHOLOGICAL DEPARTMENTS.

To the Editor of THE LANCET.

SIR,—On this subject communications appeared last week in THE LANCET which call for comment.

The utilisation of university pathological departments for money-making may bring them into competition with the pathological departments of county hospitals in an unfair manner. This hospital, for instance, has a fully equipped pathological and bacteriological department with a specialist in charge, who is only allowed to practise as such and whose livelihood depends on this practice. There is a V.D. clinic in the hospital, a few yards from the laboratories, but bloods for Wassermanns *must* be sent to a distant university. The Ministry of Health refuses to allow the county council to pay the hospital department for Wassermann tests in spite of the representations of the county M.O.H., the County Public Health Committee, the clinic medical officers, and the medical and surgical staff of the hospital. The result is that the clinic bloods are "split" and with the hospital bloods (not "split") are done weekly as a matter of routine by the pathologist, who though unpaid, is not without honour in his own laboratory when reports differ. "Seeing the wheels go round" is preferred to a five-shillings-in-the-slot postal machine delivering a piece of pasteboard!

The position is the same in an adjoining county, and will no doubt be the same in a third county which is considering the appointment of a county pathologist.—I am, Sir, yours faithfully,

Salisbury, Sept. 10th, 1923. H. ST. ARNAUD AGATE.

DEFATTED BACTERIAL VACCINES.

To the Editor of THE LANCET.

SIR,—In a lecture delivered on June 14th at St. Mary's Hospital, Prof. G. Dreyer claimed to have made an important discovery by using defatted tubercle bacilli as antigen for diagnostic and therapeutic purposes in tuberculosis. This work has been enthusiastically received by the whole press, and may arouse hopes that will not be satisfied. The Institute of Microbiology in Saarbrücken has been working on very similar lines for years and the use of defatted tubercle bacilli has proved a delicate matter. I should therefore be very much obliged if you will allow me to indicate two things that will lead to a sober valuation of Prof. Dreyer's investigations.

In 1921 [1] and 1922 [2] I published experiments that demonstrated the necessity of defatting tubercle bacilli before using them as specific antigen. I described then a special method of defatting tubercle bacilli by means of the vapours of ether or other fat-dissolving liquid, and was able to show that in this process the biologic albumin of the bacilli remains intact and unaltered. The defatted tubercle bacilli form a stable emulsion that is specifically precipitated by the serum of tuberculous persons and this so-called "tuberculo-diagnosticum" is already in constant use at many sanatoria and by medical officers to schools. The same emulsion gave complement deviation when brought in contact with serum from tuberculous persons and showed remarkable effect when used as anti-tuberculous vaccine in men.[3] These facts have been fully confirmed by Wassermann,[4] who used another process of defatting the tubercle bacilli. Of the earlier publications recommending defatted tubercle bacillus as specific antigen, Prof. Dreyer's observations appear to be a confirmation.

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[1] Annales de l'Institut Pasteur, xxxv., 797.

[2] Deutsche Archiv für klinische Medizin, cxxxviii., 253.

The second and more remarkable point in Prof. Dreyer's lecture is the fact that his tuberculous antigen withstands exposure for four hours and more to 100° C., at which temperature tubercle bacilli must, according to him, be boiled with formalin and acetone if they are to lose their acid resistance.[5] Up till now bacteriologists have always carefully tried to avoid as much as possible any alteration of the antigen contained in the living microbe, the immunising power of which is demonstrated to us daily by practical experience. That Prof. Dreyer's boiled tuberculous antigen still possesses the same immunising power is a real discovery of highest theoretical importance, unless further investigation should prove that his good results are due rather to the effect of a protein than of a real immune-therapy.

I am, Sir, yours faithfully,
W. FORNET.

Saarbrücken, Sept. 4th, 1923.

Medical News.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A fortnight's "Refresher" Course in general medicine and surgery will be given at the London Temperance Hospital in conjunction with Bethlem Royal Hospital, North-Western Fever Hospital, and the Royal Westminster Ophthalmic Hospital from Oct. 8th to 20th. The course will include daily lectures and clinical demonstrations in the wards and out-patient department. A course on genito-urinary diseases will be given at St. Peter's Hospital from Oct. 1st to 27th. In addition to demonstrations in the out-patient department a series of lectures will be given on various aspects by the members of the staff. A course of eight lectures on tropical diseases will be given by Dr. G. Low and Dr. P. Manson-Bahr at the School of Tropical Medicine, beginning on Tuesday, Oct. 2nd. The subjects considered will be the more important diseases of tropical countries. A course in laryngology, rhinology, and otology, consisting of clinical demonstrations, lectures, &c., each day from 9.30 A.M. to 5 P.M., will be given at the Central London Throat, Nose, and Ear Hospital from Oct. 8th to 20th. A further course on children's diseases will be given at the Victoria Hospital for Children from Oct. 8th to 20th, and in ophthalmology at the Royal London Ophthalmic Hospital from Oct. 8th to Nov. 3rd. The National Hospital for Diseases of the Heart and St. Mark's Hospital for Diseases of the Rectum will each give a fortnight's course on cardiology and proctology respectively, from Oct. 15th to 27th. Copies of the syllabus and further particulars regarding any of the above courses will be forwarded on application to the secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

LEBANON HOSPITAL.—Great Britain, America, Holland, and Switzerland all share in the work of the Lebanon Hospital for Mental Diseases, Asfuriyeh, Beyrout, Syria, and the report for the twelvemonth ended March 31st, 1923, shows that the institution has accomplished much good work. During the year under notice there were 279 patients under treatment including 181 new patients, of whom 132 were men and 49 women. Dr. H. Watson Smith, the medical director, states that the increase in the number of women patients necessitated the squeezing in of additional beds in the American and Philadelphia pavilions to accommodate them, and so resulted in an unavoidable congested condition of these houses. The opening of the Strawbridge Memorial House for women patients fortunately relieved this state of affairs. The general statistics show that 38 men and 18 women recovered, and that 49 men and 5 women benefited by their stay in the hospital, while 26 men and 7 women left the hospital for various reasons. The needs of the institution include a permanent and adequate water-supply at an estimated cost of £1000, an X ray plant at £500, a laundry at £1000, and a septic tank at £100. The address of the general secretary is at the Lebanon Hospital Office, 35, Queen Victoria-street, London, E.C.4.

ROYAL DENTAL HOSPITAL OF LONDON.—The prize distribution of the London School of Dental Surgery will take place at the hospital on Oct. 1st at 5 P.M., when Dr. Christopher Addison will distribute the prizes.

SMALL-POX IN ENGLAND AND WALES.—In the week ended Sept. 1st 21 cases of small-pox were reported in England and Wales, ten of these being from Gloucester. Three cases were reported in London on Sept. 7th, one each from Paddington, Finsbury, and Camberwell respectively, and in the five days following five further cases and two suspects came to light. The Camberwell patient was employed at a London hotel, and two cases in Westminster and Lewisham have been attributed to the same source. Infection in the others has been traced to a visitor recently arrived from Spain, whose indisposition was not recognised until the maid who attended her was found to be suffering from small-pox.

THE LATE DR. CLARENCE ROBINSON.—Dr. Robinson, who died suddenly at the early age of 42 on August 29th while on holiday in the Isle of Man, was a popular practitioner in Warrington. A native of Cork, he qualified L.R.C.P. & S. Irel. from Queen's College in 1903 and was appointed house surgeon at the General Hospital, Ramsgate, afterwards becoming visiting surgeon to the Ramsgate and St. Lawrence Dispensary. He went into partnership in general practice at Camberwell Green, and about 15 years ago migrated to Latchford, Warrington, where he became surgeon to the Warrington Infirmary, a member of the panel committee, and surgeon to the pensions board. In the early days of the war he worked at the Lord Derby War Hospital at Winwick, and afterwards served for five years at Thelwall Heys. He leaves a wife and two sons.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE, SPECIAL COURSE IN INFANTS' DISEASES, at the Infants Hospital, Vincent-square, Westminster, S.W.

MONDAY, Sept. 17th.—2–3.30 P.M., Dr. William Robinson: Congenital Heart. 4.30–6 P.M., Dr. Eric Pritchard: Premature Infants, Management and Feeding.

TUESDAY.—2–3.30 P.M., Dr. Eric Pritchard: Syphilis in Infants. 4.30–6 P.M., Mr. Philip Franklin: Tonsils and Adenoids. Demonstration and Operation

WEDNESDAY.—2.30–3.30 P.M., Dr. Helen Mackay: Special Cases in Wards and Out-patient Department (Diabetes and Insulin Treatment, Mongolism, Malaria, Enlarged Thymus, &c.). 4–6.30 P.M., Dr. Donald Paterson: Lecture: Encephalitis and Poliomyelitis.

THURSDAY.—2–3.30 P.M., Dr. Donald Paterson: Special Cases (Wind Swallowing). 4.30–6 P.M., Mr. M. S. Mayou: Lecture and Demonstration: Some Common Eye Conditions from the Practitioner's Point of View.

FRIDAY.—2–3.30 P.M., Dr. Eric Pritchard: Round Table Consultation. Special Cases for Diagnosis. 4.30–6 P.M., Dr. Donald Paterson: Summer Diarrhœa.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, Sept. 17th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2.30 P.M., Dr. Saunders: Medical Wards.

TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Department. 2.30 P.M., Dr. Pritchard: Medical Wards.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Burnford: Medical Wards. 3 P.M., Dr. Pernet: Skin Department.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Department. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

PANTING, L. C., M.D., B.Ch. Oxf., M.R.C.P. Lond., F.R.C.S. Eng., has been appointed Honorary Consulting Surgeon to the Helston and District Cottage Hospital.

ROBERTS, C., M.B., B.S. Lond., F.R.C.S. Eng., one of the Medical Referees under the Workmen's Compensation Act for County Court Circuits No. 5 and 8.

Certifying Surgeons under the Factory and Workshop Acts: MACKAY, W. M., M.B., Ch.B. Edin. (Crook, Co. Durham); FOXTON, H., M.B., Ch.B. Leeds (Uttoxeter).

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[3] Münchener Medizin. Wochenschr., May 11th, 1923.
[4] Deutsche Medizin. Wochenschr., March 9th, 1923.
[5] Brit. Jour. of Exp. Pathology, June, 1923, iv., 146.

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth Infirmary, &c.—H.S. £200.
Aylesbury, Royal Bucks Hospital.—R.M.O. £200.
Barbados Parish of St. Andrews.—M.O. £300.
Benenden (Kent) National Sanatorium.—Res. Asst. M.O. £250.
Bradford Royal Infirmary.—H.S. £150.
Central London Ophthalmic Hospital, St. Pancras, W.C.—H.S. £100. Jun. H.S. £50. Also X Ray O.
Dover Royal Victoria Hospital.—H.S. £180.
Dreadnought Hospital, Greenwich.—H.S. and H.P. Each £150.
East African Medical Service.—M.O. £600.
Hackney Metropolitan Borough.—M.O. for Infant Welfare Centre.
Ipswich County Borough.—Sen. Asst. M.O.H., &c. £600.
London County Mental Hospital Service.—Seventh Asst. M.O. £432.
London Jewish Hospital, Stepney Green, E.—Hon. Asst. P., Hon. S. Also Asst. to Out-Patients. £100.
Manchester, Ancoats Hospital.—Res. M.O. £200. Med. Reg. £100.
Manchester Royal Hospital, Salford.—R.M.O. £200. Two H.S.'s and Cas. H.S. Each £150.
Manchester, Royal Infirmary.—Surgical Tutor. £30.
Middlesex Hospital, W.—Radium O. £300.
Mount Vernon Hospital for Diseases of the Chest, Northwood, Middlesex.—Asst. P.
Newcastle-on-Tyne Dispensary.—Hon. Phys.
Nottingham City Education Committee.—Jun. Asst. Med. Insp.
Prince of Wales's General Hospital, Tottenham, N.—H.S. £150. H.P. £150. Also J.H.S. and J.H.P. £110 each.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. H.S. £100.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—H.S. £150.
Royal Naval Medical Service.—Surgeon-Lieutenants.
Saint Pancras Dispensary, 39, Oakley-square, N.W.—Hon. S.
Walsall County Borough.—Asst. M.O.H. £650.
West African Medical Service.—M.O. £660.
West Bromwich and District Hospital.—Res. Asst. H.S. £180.
Wolverhampton and Staffordshire Hospital.—Res. M.O. £150.

Births, Marriages, and Deaths.

BIRTHS.

Burton.—On Sept. 8th, to the wife of A. H. G. Burton, M.D., of 13, Beaufort-gardens, Ilford—a daughter.

Graham-Stewart.—On Sept. 4th, at Northdown-avenue, Cliftonville, Margate, the wife of A. Graham-Stewart, M.B., Ch.B., of a son.

Hughes.—On Sept. 6th, at Heylands, Chagford, Devon, the wife of Dr. H. Ll. Glyn Hughes, D.S.O., M.C., of a daughter.

Stokes.—On Sept. 4th, at Restholme, Cantelupe-road, Bexhill-on-Sea, the wife of Dr. Kenneth Stokes, of a daughter.

Warrick.—On Sept. 1st, at Blackheath, the wife of R. W. Warrick, M.B., B.S., of a son.

MARRIAGES.

Baxter—Stops.—On Sept. 5th, at Emmanuel Church, Didsbury, Manchester, Stephen Edw. Baxter, M.R.C.S., L.R.C.P., to Ruth Jessica, second daughter of the late T. S. Stops, J.P., of Tiffield, Towcester, Northants.

Blair—Henderson.—On Sept. 5th, at St. Cuthbert's Church, Colinton, Edinburgh, R. G. Blair, M.C., M.B., to Nicolina Margaret, daughter of W. R. Henderson, of Chisholme, Roxburghshire, and Menld, Oxton, Cheshire, and Mrs. Henderson.

Browne—Bott.—At Grange-in-Borrowdale, on Sept. 5th, Leonard Foster Browne, M.D., of 9, Harley-street, W., to Violet, fourth daughter of the Rev. Richard Bott, of Cotehill, near Carlisle.

McCausland—Simson.—On Sept. 10th, in London, by special licence, Dr. Albert McCausland, of Swanage, to Miss Mildred Spicer Simson.

McNee—Le Bas.—On Sept. 4th, at the Chapel of the Charterhouse, London, John W. McNee, D.S.O., M.D., to Geraldine Z. L. Le Bas, only child of the late Cecil H. A. Le Bas and of Mrs. Le Bas, 20, Ridgmount-gardens, London.

Robertson—Black.—On Sept. 1st, at Holy Trinity Church, Skirbeck, Boston, Dawson Cameron, M.B., Ch.B., to Ethel Freda Ogle, only daughter of Mr. and Mrs. Arthur Black, Burton House, Boston.

Travers Smith—Ievers.—On August 4th, in London, Richard Travers Smith, M.D., F.R.C.P.I., of 17, Harcourt House, Cavendish-square, W. 1, to Ernesta Carlotta Nina, widow of James Butler Ievers, of Quinville Abbey, Quin, Co. Clare, younger daughter of the late Surgeon-General George Whitla, of The Drive, Hove, and Mrs. Whitla.

DEATHS.

Hartridge.—On Sept. 8th, at Wimpole-street, W. 1, Gustavus Hartridge, F.R.C.S., aged 73 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

SOME BEARINGS OF ZOOLOGY ON HUMAN WELFARE.*

By Prof. J. H. Ashworth, F.R.S.

The bearings of zoology on human welfare—as illustrated by the relation of insects, protozoa, and helminths to the spread or causation of disease in man—have become increasingly evident in these later years.

Arthropods as Carriers of Disease.

At the time of the last meeting of the British Association in Liverpool, held in the year 1896, insects were suspected of acting as transmitters of certain pathogenic organisms to man, but these cases were few and in no single instance had the life cycle of the organism been worked out and the mode of its transmission from insect to man ascertained. Sir Patrick Manson, working in Amoy, had shown (1878) that the larvæ of *Filaria bancrofti* undergo growth and metamorphosis in mosquitoes, but the mode of transference of the metamorphosed larvæ was not determined until 1900. Nearly two years after our last meeting here the part played by the mosquito as host and transmitter of the parasite of malaria was made known by Ross. In addition to these two cases at least eight important examples can now be cited of arthropods proved to act as carriers of pathogenic organisms to man—e.g., Stegomyia—yellow fever, Phlebotomus—sandfly fever, tsetse-flies—sleeping sickness, Conorhinus—South American trypanosomiasis (Chagas's disease), Chrysops—*Filaria (Loa) loa*, the flea *Xenopsylla cheopis*—plague, the body louse—trench fever, relapsing fever, and typhus, and the tick Ornithodorus—African relapsing fever. In selecting examples for brief consideration I propose to deal very shortly with malaria, although it is the most important of the insect-carried diseases, because the essential relations between the Anopheles mosquito and the parasite are known to everyone here. There still remain lacunæ in our knowledge of the malarial organisms. Ross and Thomson (1910), working in this city, showed that asexual forms of the parasite tend to persist in small numbers between relapses, and suggested that infection is maintained by these asexual stages. Such explanation elucidates those cases in which relapses occur after short intervals, but the recurrence of the attacks of fever after long intervals can only be explained by assuming that the parasites lie dormant in the body—and we know neither in what part of the body nor in what stage or condition they persist. Nevertheless, the cardinal points about the organism are established, and preventive measures and methods of attack based on a knowledge of the habits and bionomics of Anopheles have been fruitful in beneficial results in many parts of the world.

Knowledge of the Methods of Disease Transmission.

If we desire an illustration of the vast difference to human well-being between knowing and not knowing how a disease-germ is transmitted to man, we may turn to the case of yellow fever. When this pestilence came from the unknown, and no one knew how to check it, its appearance in a community gave rise to extreme despair and in many cases was the signal for wholesale migration of those inhabitants who could leave the place. But with the discovery that Stegomyia was the transmitting agent all this was changed. The municipality or district took steps to organise its preventive defences against a now tangible enemy, and the successful issue of these efforts, with the consequent great saving of life and reduction of human suffering in the Southern United States, in Panama, in Havana, and in other places, is common knowledge. It is a striking fact that during 1922 Central America, the West Indies, and all but one country of South America were free from yellow fever, which has ravaged these regions for nearly two centuries. The campaign against Stegomyia is resulting, as a recent Rockefeller report points out, in yellow fever being restricted to rapidly diminishing isolated areas, and this disease seems to be one which by persistent effort can be brought completely under control.

Refinements of Entomological Research.

The relation of fleas to plague provides one of the best and most recent illustrations of the necessity for careful work on the systematics and on the structure and bionomics of insects concerned in carrying pathogenic organisms. Plague was introduced into Bombay in autumn 1896, and during the next two years extended over the greater part of Bombay Presidency and was carried to distant provinces.

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* A section of the Presidential Address delivered to the Section of Zoology, British Association for the Advancement of Science, at the annual meeting in Liverpool on Sept. 13th.

The Indian Government requested that a Commission should be sent out to investigate the conditions. This Commission, which visited India in 1898-99, came to the conclusion (1901) that rats spread plague and that infection of man took place through the skin, but—and this is amazing to us at the present day—" that suctorial insects do not come under consideration in connexion with the spread of plague." Further observations, however, soon showed this conclusion to be erroneous. Liston found in Bombay in 1903 that the common rat-flea was *Pulex* (*Xenopsylla*) *cheopis*, that it was present in houses in which rats had died of plague and in which some of the residents had become infected, that the plague bacillus could multiply in the stomach of this flea, and that the flea would—in the absence of its usual host—attack man. These observations pointed to the importance of this flea in the dissemination of plague, and the Second Plague Commission, which was appointed and began work in 1905, definitely proved that *Xenopsylla cheopis* is the transmitter of the plague organism from rat to rat and from rat to man. The mechanism of transmission of the plague bacillus was worked out by Bacot and Martin in 1913. Subsequent research has shown that all fleas of the genus *Xenopsylla* living on rats are not of the one species. In plague areas it was found that *X. cheopis* was the common flea, while *X. astia* was the prevalent species in those districts which had remained free from plague or had suffered only lightly.

The distinction of *X. cheopis* from *X. astia* is not an entomological refinement with purely systematic significance, but corresponds with a different relation of the species to the epidemiology of plague, and hence becomes a factor of great practical importance. If through these researches it has become possible by examination of the rat-fleas of a locality to estimate accurately its liability to plague, anti-plague measures may henceforward be restricted to those areas in which plague is likely to occur—i.e., where *cheopis* is the predominant flea. Thus a great economy of effort and of expenditure and a higher degree of efficiency may be achieved; in fact, the problem of the prevention or reduction of plague may be brought from unwieldy to practicable proportions. When it is remembered that since we last met in Liverpool some 10¼ millions of people have died in India from plague we have a more than sufficient index of the importance of a precise knowledge of the systematics, structure, and bionomics of the insect-carrier of *Bacillus pestis*.

Classification of Protozoa.

Another of the outstanding features of the period under review has been the extensive and intensive study of the Protozoa. The structure and the bionomics and life-history of these organisms have been investigated with the help of the finest developments of modern technique. It is fitting here to record our acknowledgement to two staining methods —Heidenhain's iron-hæmatoxylin and the Romanowsky stain (including Giemsa's and Leishman's modifications), which have added greatly to our technical resources.

There is time to refer only to certain of the Protozoa which directly affect man. Twenty years ago our knowledge of the few species of Protozoa recorded from the human alimentary canal was defective in two important respects—the systematic characters and the biology of the species—so there was much confusion. Subsequent investigations, and especially those of the last ten years (by Wenyon, Dobell, and others), have cleared up most of the doubtful points, but owing to the difficulties of size and the paucity of characters available it is by no means easy in practice to distinguish certain of the species. Of the 17 species now known to occur in the intestine of man *Entamœba histolytica* has received particular attention. This organism lives as a tissue parasite in the wall of the large intestine, where, as a rule, the damage caused is counterbalanced by the host's regenerative processes. But when the destruction outstrips the regeneration intestinal disturbance results, leading to the condition known as amœbic dysentery.

In all work with human Entamœbæ there is need for critical determination of the species, for, in addition to *E. histolytica*, a closely similar species, *E. coli*, is a common inhabitant of the intestine. This, however, is a harmless commensal, feeding on bacteria and fragments derived from the host's food. The distinction between the two species rests chiefly upon the characters of the nuclei and of the mature cyst—quadrinucleate in *histolytica* and octonucleate in *coli*—and considerable care and technical skill are requisite in many cases before a diagnosis can be given. And yet this distinction is definitely necessary in practice, for indiscriminate treatment of persons with Entamœbæ is indefensible; treatment is only for those with *histolytica*; it is useless for those with *coli*, and subjects them needlessly to an unpleasant experience.

A notable result of recent work is the proof that the more common intestinal protozoa, formerly believed to be restricted to warmer countries, occur indigenously in Britain. This was first established by a group of observers in this city, and has been confirmed and extended by subsequent workers. There is good reason for believing that in this country the incidence of infection with *E. histolytica* is about 7 to 10 per cent., and with *E. coli* about five times as great (Dobell).

Mode of Entry of Parasitic Worms.

Of the problems presented by the parasitic worms the most momentous are those associated with Ankylostoma and its near relative Necator, which are prevalent in countries lying between 36° N. and 30° S.—a zone which contains more than half the population of the earth. Heavy infection with Ankylostoma or with Necator produces severe anæmia, and reduces the host's physical and mental efficiency to a serious degree. Until 1898 there was no suggestion that infection was acquired in any other way than by the mouth, but in that year Looss published his first communication on the entry of the larvæ of Ankylostoma through the skin, and in 1903 gave an account of further experiments which proved that dermal infection resulted in the presence of worms in the intestine. At the meeting of this Association in Cambridge in 1904 Looss demonstrated to a small company his microscopical preparations showing the path of migration of the larvæ. His investigations served to establish the importance of the skin as the chief portal of entry of Ankylostoma, and pointed the way to effective methods of prevention against infection.

Another notable advance in helminthology is the working out of the life-cycle of Schistosoma (Bilharzia)—a genus of trematode worms causing much suffering in Egypt and elsewhere in Africa, as well as in Japan and other parts of the world. We owe chiefly to Leiper's work (1915-16) our knowledge of the life-history and method of entry into man of the Egyptian species of Schistosoma. He demonstrated that two species of this parasite occur in Egypt, and established that the miracidia develop in different intermediate hosts: those of *S. mansoni* enter Planorbis, while those of *S. hæmatobium* penetrate into Bullinus—the molluscs being abundant in the irrigation canals. The sporocysts produce cercariæ, which escape from the snails and gather near the surface of the water, and experiments with young mice and rats showed that the cercariæ attach themselves to the skin, enter, and reach the portal system, from which they travel to the veins of the lower part of the abdomen. Infection of man takes place chiefly through the skin when bathing or washing in water containing the cercariæ, though infection may also occur through drinking such water. And so, at last, these worms which have troubled Egypt for at least 30 centuries have become known in all their stages, and measures for preventing infection—which were of great use during the war—have been devised and curative treatment introduced.

The period under review has obviously been one of great activity in research on helminths, and fertile in measures tending to reduce the risks of infection. Insects, protozoa, and helminths not only inflict direct injury on man; they also diminish his material welfare by impairing the health or causing the death of his horses, cattle, and sheep, by destroying food crops during growth and, in the case of insects, by devouring the harvested grain. The measure of control which man can gain over insects, ticks, and endoparasitic organisms, will determine largely the extent to which he can use and develop the natural resources of the rich tropical and sub-tropical zone of the earth.

Other applications of zoology to human well-being cannot be dealt with owing to lack of time, but mention should be made of two—the researches on sea-fisheries problems which have formed an important branch of the zoological work of this country for 40 years, and the studies on genetics which made possible an explanation of the mode of inheritance of a particular blood group, and of some of the defects (e.g., colour-blindness and hæmophilia) and malformations which appear in the human race.

COLONIAL HEALTH REPORTS.

Sierra Leone.[1]

THE population of Sierra Leone at the census taken in 1921 was 85,163, of whom 44,142 dwelt in Freetown, the capital. The European resident population in the colony numbered 1161. The general health of both European and African officials compares rather unfavourably with that of the previous year. While the death-rates were lower, the invaliding and general sick-rates and ineffectiveness were higher; and though the total number of cases of illness treated showed a decrease of 5837 as compared with 1920, this is said to have been due to some extent to the closing of certain dispensaries. There was a mild outbreak of small-pox between April and June, 31 cases with one death, and an increase in malaria of 218 cases. Dysentery showed a marked decrease, from 404 cases in 1920 to 185 in 1921; it has almost disappeared from Freetown prison. Helminthic diseases are very prevalent, especially ankylostomiasis, of which there were 118 cases; eucalyptus oil appears to be efficacious in treatment, also thymol, or beta-naphthol, or both. The health of prisoners is stated to have been "most unsatisfactory" for part of the year: in the Freetown prison the sick-rate was 66·03, and the death-rate 78·66 per 1000 of average strength, the daily average number in custody being 318. Towards the end of the year, however, the health conditions improved, and dysentery became "almost negligible." Among the European troops in the colony there was not a single death; the chief cause of sickness was malaria (195 cases). Among the non-European troops venereal disease (179 cases) and malaria (66 cases) were the most prevalent affections.

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[1] Annual Medical and Sanitary Report, 1921. Freetown Government Printing Office. 1922.

The report states that it is difficult to get suitable men for the sanitary service, which is not popular. Progress was made in anti-malarial work at Freetown; "92,378 houses were inspected, resulting in the discovery of 483 breeding places." As the population of the town is stated as 44,142, it is to be presumed that this means "house-inspections," not individual houses. Oiling of cesspits was carried out, and a mixture of kerosene and "solido disinfectant fluid" was found to be very useful; the two fluids mix well, and fly breeding is prevented as well as that of mosquitoes. A slight outbreak of small-pox occurred in Freetown (26 cases); this was probably due to introduction of infection from Grand Bassa (Liberia). Vaccination does not appear to be satisfactory. In the colony there were 35,989 children vaccinated during the year; in 10,917 the operation was successful, in 6794 unsuccessful, but 18,278 other children were not inspected; even in Freetown, out of a total of 14,708 there were 9653 not inspected. When small-pox became epidemic in Freetown Police District vaccination was made compulsory. There has been a great reduction in the prevalence of dysentery; only 184 cases were treated in Government institutions in 1921, as compared with 394 in 1920, and 574 in 1918. On account of the prevalence of intestinal disorders in Freetown an extensive examination of tinned foodstuffs was carried out, with the result that several thousands of articles were destroyed by order of the magistrate, including 5764 tins of sardines and 132 barrels of biscuits. It is disquieting to hear that there was a scarcity of water at Freetown from the middle of March to the middle of May, and that the city was placed on a restricted supply. "The problem of further increasing the water-supply will sooner or later have to be faced and seriously grappled with." To an outside observer it would appear to be a matter requiring immediate action. The average maximum temperature at Tower Hill, Freetown, was 91° F. in February and March, and 90° in January and April; in January and February no rain fell at all, and in March only 0·11 inch. A restricted supply under such conditions would entail hardship, and might be most detrimental to health. On the other hand, it is encouraging to learn that a model village, the first of its kind, has been laid out at Giema, under the local Chief (who had been educated at the school for the sons of Chiefs). It is, of course, not perfect in all respects, but "is one of the best laid out and cleanest villages the senior sanitary officer has seen in Sierra Leone." Dr. J. Beringer concludes his report by urging the necessity for a hospital for infectious diseases at Freetown; the only accommodation now available is quite unsuited for the purpose.

Weihaiwei.

This territory, leased to Great Britain by China in 1898, is part of the province of Shantung. and comprises a strip of land 10 miles wide, with a coastline of 72 miles. The island of Liukung, lying east and west across the bay, is also included in the territory, and affords excellent shelter from the sea. Port Edward, on the mainland, is the only port, and is also the seat of government. The total area of the territory is 288 square miles, and the native population at the census of 1921 was 154,416. The foreign population is mainly British, and varies from a small number in winter to several hundreds in summer, when visitors arrive from all parts of China in order to enjoy the salubrious climate. In addition, several thousand personnel of the China Squadron spend a few months each summer in the territory. The summer of 1922 was exceptionally hot, but the rainfall was just above the average. General health conditions among the residents and visiting European population on the mainland were exceptionally good. Apart from three cases of dysentery, there were no cases of infectious diseases. There was one birth and one death. There were several cases of septic sore-throat, probably of an infectious nature, affecting only newcomers to China. The health of the native population was good. During the first and the last two months of the year a number of mild cases of influenza were treated. The number of cases of dysentery and diarrhœa treated was 256, as compared with 350 in the previous year. There were 31 persons holding licences to smoke opium, their average age being 63. The highest mean temperatures in 1922 were 80 in June and 86 in July and August. Rain or snow fell on 78 days, with a total rainfall of 24·84 inches. The snowfall in November was 3 feet, the deepest within the memory of any inhabitant.

Gambia.

In a report prepared by Mr. C. R. Workman, Colonial Secretary, on the affairs of the Colony and Protectorate for the year 1922, it is recalled that the Gambia, though the smallest, is the oldest of the possessions of England in Africa. The population of Bathurst, the chief town, is 9395, with 205 Europeans. The death-rate in 1922 was 46·62 per 1000, the average since 1910 having been 42 per 1000. The chief causes of death were pneumonia and tetanus. Accurate statistics from the Protectorate are not obtainable, but a careful return from the North Bank Province for 1922 gives 1628 births and 905 deaths. In this Province an outbreak of bubonic plague occurred which was traced to a focus in French Senegal; 34 cases were counted, and only four of them recovered. Active measures were taken to isolate the infected villages, and control stations were established on the route to Bathurst. It was only by vigilance and a strict enforcement of regulations that the capital was saved from a visitation of the disease. The meteorological returns from Bathurst for 1922 showed: Average maximum shade temperature, 92·2° F.; average minimum shade, 63·4° F.; average mean, 77·8° F.; rainfall, 45·71 inches.

THE "MINTITE" PATENT FINISH HOT-WATER BOTTLE.

WE have previously reported upon the heat and acid-resisting qualities of "Mintite" patent finish for articles made of indiarubber. This finish, which is an application of mica, is now used for hot-water bottles, and, in addition to the advantages already mentioned, it is claimed that tensile strength is increased. Hot-water bottles treated by this method should certainly possess a longer life than the ordinary untreated rubber article. The patentee is Mr. Louis Minton, Trevelyan Buildings, Manchester.

Summer Time will cease on Sunday next, Sept. 16th, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M. Summer Time will thus be followed by the hour 2–3 A.M. Greenwich Time. Summer Time will be prolonged in France, Belgium, and Holland until Oct. 6–7th.

Mr. F. F. Burghard informs us that he has retired from practice and has left London. His permanent address is Craythorne, Rolleston, Burton-on-Trent, Staffs.

Uniped.—The advantages of the all-metal limb do not in the opinion of the Pensions Ministry experts outweigh the disadvantage of its high cost. The light metal limb with wooden socket which was decided upon by the 1921 Committee, continues to be supplied and to give satisfaction. The wooden Anglesea pattern limb can be made as light or even lighter than the metal limb. Various makers now supply limbs with metal sockets at a price about the same as that which the Ministry is prepared to pay.

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A Lecture
ON
INSULIN AND ITS VALUE IN MEDICINE.

Delivered before the Section of Physiology of the British Association at Liverpool on Sept. 17th, 1923,

BY J. J. R. MACLEOD, F.R.S., M.B., CH.B. ABERD.,
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AMONG the complex chemical changes which go on in the animal body and upon which life depends, carbohydrates play an essential rôle. Their sources in the herbivorous animals is mainly the cellulose and starch synthesised by plants and in the carnivorous animals it is partly the starch-like substance called glycogen as which they are stored in animal tissues, and partly proteins and, to a less extent fats, from which they are derived by chemical changes occurring in the body. The starch or cellulose taken with the food is resolved by the digestive process into the so-called monosaccharides of which glucose is the most important. The glucose is absorbed into the blood and is carried to the liver and muscles where most of it is converted into glycogen. Between the periods of absorption of glucose the reverse process occurs and glycogen becomes broken down to glucose again, which is then oxidised in the tissues (muscles) so as to produce energy, the final products of this oxidation being carbon dioxide and water. While digestion is proceeding the supply of glucose for oxidation may come directly from the glucose which is being absorbed from the alimentary canal, but of this we cannot be certain. In any case, before it can be oxidised in the tissues the glucose molecule must undergo a series of preliminary changes and it is probable that these proceed step by step in such a manner that a long series of intermediary substances is formed each one of which exists in a certain state of dynamic equilibrium with the others so that an increase, or a decrease, in any one of them will cause a disturbance extending throughout the entire process.

CARBOHYDRATE METABOLISM.

It is a study of these changes that constitutes the subject of the metabolism of the carbohydrates, and the question arises as to how they may be investigated. Glucose and glycogen are the only two intermediary products that accumulate in the body in sufficient quantities to be measurable by chemical means, the glucose being dissolved in the blood and other fluids of the body and the glycogen, deposited in the solid tissues, particularly the liver and the muscles. Our conclusions concerning the metabolism of the carbohydrates have therefore to be drawn mainly from observations on the changes which occur in the quantities of these two substances in the blood, urine and tissues and from the behaviour of the respiratory process of the animal as a whole.

But the metabolism of the carbohydrates does not proceed independently, for, in the chain of processes which precede the final oxidation of glucose, some substance is formed which is also intermediary in the metabolism of the other proximate principles of food—namely, fats and proteins. Through the formation of this intermediary substance transmutation of one proximate principle into another becomes possible, thus carbohydrates may be formed from proteins and fats from carbohydrates. The metabolism of the three proximate principles, therefore, is closely interwoven so that when anything occurs to interfere with that of one of them some change is likely to occur in the others. When the metabolism of carbohydrate becomes upset, for example, that of fats also goes out of order, with the result that incompletely oxidised derivatives, known as the ketone bodies, accumulate in the body and may act as poisons.

A Break in the Metabolic Cycle.

These facts will make it evident that the entire process of metabolism is liable to become upset when anything occurs to prevent the transformation of one of the intermediary carbohydrate substances into the others and this is precisely what occurs in the disease known as diabetes. Somewhere in the series of metabolic processes which precede the oxidation of glucose an essential chemical change fails to proceed rapidly enough to keep pace with the other changes with the result that this sugar accumulates in the blood in which its concentration becomes so high that some is excreted by the kidneys and appears in the urine. Hyperglycæmia and glycosuria, the two earliest symptoms of the disease, are thus explained and for long there may be no other symptom. Usually, however, the fault upon which they depend becomes still more pronounced, so that its effects spread further along the chain of metabolic processes and the final oxidation of glucose fails to occur as is revealed by a failure of the respiratory quotient—the ratio between oxygen and carbon dioxide in the respired air—to become raised as it should following the ingestion of carbohydrates. The metabolism of fats also comes to be interfered with so that they fail to be completely oxidised, so that serious symptoms supervene, known as diabetic coma, due to the toxic action of the ketone bodies. The entire chemical laboratory of life becomes disorganised with the result that the tissues disintegrate, leading to extreme emaciation and to a lowering of the natural resistance of the body against infections, both of which are other symptoms of the disease.

It is evident, therefore, that the immediate problem of diabetes consists in finding the cause for the fault in the chemical processes by which the glucose molecule is prepared for oxidation. Not so much in detecting the exact stage at which this fault occurs, although this is highly important, as in finding out what has gone wrong with the mechanism by which the metabolic process is controlled.

As a result of long years of investigation both in the laboratory and the clinic it has come to be known that many of the chemical processes in the body are controlled by substances called hormones, and it has been supposed that one of these must also control the process of carbohydrate metabolism. The question was to find this anti-diabetic hormone, as we may call it, and it is this which has been achieved in the discovery of insulin.

EARLY FAILURES TO FIND THE ANTI-DIABETIC HORMONE.

The steps which preceded this discovery extend over many years, and there is probably no chapter in the history of medical science that more clearly shows the value of painstaking and patient research, both in the clinic and the laboratory, than that which records these steps. The earlier investigations culminated in 1889, when it was discovered by von Mehring and Minkowski that removal of the pancreas or abdominal sweetbread from dogs causes severe diabetes from which the animals succumb in two or three weeks. The hypothesis was therefore made that the anti-diabetic hormone is secreted into the blood by the pancreas—an internal secretion—and it was soon found that its action must be entirely independent of that of the (external) secretion into the intestine of the powerful digestive juice, since diabetes did not occur when the pancreatic ducts were tied. This independence of the external secretion and the anti-diabetic function of the gland made it seem probable that each is the function of different portions of the gland, and, as a matter of fact, it was known, through the work of Langerhans, which preceded that of von Mehring and Minkowski by some 20 years, that the pancreas contains islets of peculiar cells embedded in the connective tissue lying between the tubules or acini which are the source of the external secretion. Anatomical investigations, particularly by Diamare and Laguesse, demonstrated that these islets of Langerhans, as they came to be called, are present in all the vertebrates, although in some, such as the bony fishes, they exist, not embedded in the pancreas, but as distinct glands situated in the mesentary apart from this organ. The cells composing them were also found to possess characteristic microscopic features. As this work progressed from the anatomical side pathologists discovered that microscopic changes could frequently be detected in the cells of the islets in patients who had died of diabetes, and the surmise that they must produce the internal secretion which controls carbohydrate metabolism became so strong that the name insulin was suggested for it by Sir E. S. Schafer. But so far there was no direct evidence to support the hypothesis that it is by secreting insulin into the blood that the pancreas owes its control over carbohydrate metabolism. This could be furnished most satisfactorily, by showing that an extract prepared from the pancreas or from the principal islets of the bony fishes was capable of removing the symptoms in a depancreated dog or a diabetic patient. Attempts to prepare such extracts by the usual means were, however, without success, and some investigators concluded that the power of the pancreas to control carbohydrate metabolism must depend on some other mechanism, not requiring the internal secretion of insulin. Others attributed the failures in the isolation of this hormone to the fact that it was destroyed during the process of extraction by the powerful digestive ferments which such extracts of the pancreas must also contain. To circumvent the action of these, alcohol was tried as the extractive medium by Zuelzer and by E. L. Scott, and here a certain degree of success was attained, both in the laboratory and in the clinic, when for similar reasons, the extracts were administered subcutaneously instead of by mouth. These investigations, which were made in 1908, were not carried far enough, however, to justify the use of the extracts in the treatment of diabetes, being discontinued because of the dangerous toxic effects which followed their administration to man. Some years prior to this (in 1904) Rennie and Fraser also tried to obtain active extracts by using the principal islets of bony fishes which, as we have seen, are homologous with the islets of Langerhans of the mammalian pancreas. As more recent work has shown that these structures are by far the richest known source of insulin, it is remarkable how near these workers came to success. They failed to convince others partly because they did not have at their disposal the more recently evolved methods for measurement of the percentage of sugar in the blood, and partly because they usually gave, either the fresh glands or extracts of them, by mouth instead of subcutaneously.

DEMONSTRATION ON ANIMALS.

Discouraged by these repeated failures most physicians gave up all hope that a pancreatic extract capable of removing the symptoms of diabetes would ever be discovered, and the search for insulin became the problem of the physiologist. It was necessary in the first place to demonstrate that such a hormone really exists in the animal body, quite apart from its isolation in extracts. This was achieved in 1916 by A. H. Clark, who compared the rate at which glucose is used by the isolated mammalian heart kept alive by perfusing it with a nutritive fluid alone with that of one perfused with fluid which had previously been passed through the blood-vessels of the pancreas. Decidedly more glucose was found to disappear from the solution that had passed through the pancreas, indicating that a hormone stimulating sugar utilisation must have been added to it.[1] The experiment showed conclusively that the pancreas does produce insulin, and it remained to devise means by which the hormone could be preserved in extracts of the gland. To succeed in doing so required the development of some new and untried method of attack, and this was suggested by F. G. Banting. His plan was to make extracts, not of the fresh normal pancreas, as others had done, but of pancreas which had been caused to undergo partial degeneration by entirely blocking the secreting ducts, previous investigators having shown that this degeneration does not greatly affect the isles of Langerhans, but mainly the cells which produce the digestive juice. With the assistance of C. H. Best, Banting blocked the ducts by tying them in dogs, and some weeks later removed the degenerated pancreas and made extracts from it. When these were injected into other dogs that had been rendered diabetic by removal of the pancreas, it was found that the two main symptoms of the disease, hyperglycæmia and glycosuria, were greatly diminished. This showed with little doubt that the anti-diabetic hormone could be extracted from the pancreas provided its destruction by the digestive ferments was circumvented. The next step was to find methods by which extracts containing it could be made from the intact gland, for, of course, the supply from partially degenerated pancreas could never be sufficient to investigate thoroughly the full physiological action of the extract and thus to determine its possible clinical value. Extracts of early fœtal pancreas were tried by Banting and Best, since it was known that the digestive ferments are absent until shortly before birth. They were found to have the same action as those from the degenerated gland, and this led to a re-trial of alcoholic extracts of the normal undegenerated gland of cattle. Again successful results were obtained, and not only were the hyperglycæmia and glycosuria found to be diminished by the extracts, but by their repeated injection the diabetic animals improved greatly in general condition, and one of them lived for over two months, when it was killed for investigation.

Provided with a larger supply of extract, it now became possible to test its effect on the other symptoms of diabetes in animals. Besides hyperglycæmia and glycosuria, these symptoms are that after feeding with carbohydrates glycogen fails to be deposited in the liver, the relationship between the intake of oxygen and the output of carbon dioxide acid in the respired air—the so-called respiratory quotient—does not become altered. Fats also accumulate in the liver and blood, and, since the carbohydrate fires are burning low, they fail to be completely oxidised and appear as ketone bodies in the urine. These objective symptoms, common to depancreatised animals and diabetic patients, are associated with others of a subjective nature and extreme emaciation. With the invaluable assistance of J. B. Collip, the symptoms were found to be promptly removed by the extract. It has since been found, if insulin be given daily and excess of fat removed from the diet, that the depancreatised animals can be kept alive in excellent nutritive condition for over four months at least.

APPLICATION TO MAN.

These results obtained in the physiological laboratory proved conclusively that the elusive anti-diabetic hormone had been discovered, and that the time had now arrived to see whether the extracts would be equally efficacious in removing the symptoms of diabetes in man. The first attempts to do this were met with the difficulty that the extract caused considerable irritation at the site of injection, so that the injections could not be sufficiently repeated to test their real value although a temporary reduction in the hyperglycæmia and glycosuria were found to occur. The clinical application of the discovery of insulin came to depend on the removal from the alcoholic extracts of pancreas of the irritating substances, and this was achieved by Dr. J. B. Collip by a method of fractional precipitation with alcohol. By the use of the purified preparation it soon became possible to show that the results of the laboratory were precisely duplicated in the clinic, and it will suffice if I describe those obtained by Banting, Best, Collip, Campbell, and Fletcher on a boy of 14 years suffering from the acute form which the disease usually takes at this age. Hyperglycæmia, glycosuria, ketonuria, and extreme emaciation were prominent objective symptoms, and they could not be removed by the most careful dietetic treatment. The boy had lost all interest in his surroundings and lay in bed most of the time. There was little prospect that he could live for many months longer. Injections of insulin given, usually twice daily, from Jan. 23rd to Feb. 4th, 1922, had an immediate effect in removing all of the symptoms, with the exception that small amounts of sugar appeared occasionally in the urine due quite clearly to the fact that sufficient insulin had not been given. "The boy became brighter, more active, looked better, and said he felt stronger," and it was difficult to realise that the serious invalid of yesterday had become the convalescent of to-day.

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[1] E. J. Starling and others had previously shown that acid extracts of pancreas often caused the isolated heart to use more

Large Scale Production.

With the aid of the Connaught Antitoxin Laboratories of the University of Toronto work was now started to produce insulin in larger quantities, but the serious difficulties which were encountered made it impossible to obtain enough to treat more than a few cases during the early months of 1922. Later in the year, by collaboration with manufacturing firms in the States, and, through the Medical Research Council in this country the supply became sufficient, so that samples were sent for clinical trial to several hospitals and much information regarding the therapeutic value of insulin in the different forms of diabetes soon became available. These show it to be invaluable in the treatment of acute cases in which the symptoms cannot be removed by the most careful dietetic control. Especially in coma is insulin invaluable, for by stirring up the fires of carbohydrate combustion insulin quickly rids the organism of the ketone bodies to which this, often fatal, symptom is due. Insulin undoubtedly saves the lives of many of these patients. Equally useful has it proved to be in less acute cases in which either, because of dietetic indiscretion, or the incidence of some acute infection such as influenza, the symptoms have become suddenly acute and dangerous.

The milder types of diabetes, which are relatively common in the later years of life, are usually amenable to dietetic treatment alone, and do not require insulin except when complications supervene, such as gangrene or some concurrent acute disease, and it is probable that the constant use of insulin is unnecessary in about three-fourths of all cases of the disease. Its value in the majority of cases is when emergencies arise, for example, by treatment with insulin for some days preceding the administration of anæsthetics for surgical purposes, the grave risks under which the operation was previously conducted in diabetic patients are greatly minimised. But it must not be overlooked that even in the routine treatment of these chronic cases insulin may prove of value. In this connexion it is significant that A. N. Allen, working in my laboratory, has found that the amount of sugar which disappears from the urine *for each* unit of insulin when it is given to depancreatised dogs in small doses is much greater than with large doses. It may prove useful, therefore, to give small doses of insulin in the more chronic type of case which, for one reason or another, is not responding favourably to dietetic measures alone

Method of Administration.

This naturally raises the question of the method of administration. In acute cases this must be subcutaneously or intravenously so as to circumvent the destruction of insulin by the powerful digestive juices of the stomach and intestine, but it is possible when only small amounts are required, as in mild cases, that sufficient absorption may occur from the skin by applying an ointment, or from the alimentary canal by oral administration.

It is often asked whether treatment with insulin brings about a cure of the disease; does its repeated administration by taking the strain off the endogenous production of insulin by the patient's pancreas allow this gland to recuperate its lost function and so make further use unnecessary? I will not venture to reply to this question in definite terms, for it would be rash to do so from the experience of little more than a year since insulin became available. It is nevertheless significant that regeneration of new islet tissue has been demonstrated by R. R. Bensley to occur in the pancreas of certain laboratory animals months after ligation of the ducts, for although, as we have seen, the acini are mainly affected by this operation, the islets also become involved to be replaced later by new islet tissue. Diabetes, if untreated, is a progressive disease, probably because of the strain which is put upon the remaining, still unaffected, islets to supply enough insulin to metabolise the carbohydrates in circulation. If this faulty balance between insulin and carbohydrate is corrected, either by reducing the carbohydrate supply through dietary regulation or by supplying more insulin from without, the strain on the islets may be so far relieved that they can develop their inherent powers of regeneration.

VALUE OF INSULIN IN METABOLIC INVESTIGATIONS.

Although there can be no doubt of the high therapeutic value of insulin in the treatment of many cases of diabetes, its value as a new instrument for the investigation of other problems of metabolism than those relating to this disease is also high. It furnishes the physiologist with a new instrument for the investigation of the many problems connected with the chemical processes which go on in the body—with a key which may serve to unlock some of the numerous doors which stand in the way to an understanding of the working of the animal machine. Evidence for this belief is founded among other things on the striking effects of insulin on normal animals. When it is administered to rabbits, for example, the first effect is a very rapid lowering in the percentage of sugar of the blood—first observed by J. B. Collip—and when this reaches a certain level symptoms of a peculiar nature supervene. These consist usually of violent convulsive seizures each lasting for a minute or so, and of a gradually increasing state of coma, with a fall in body temperature, ending often in death from respiratory failure. Symptoms of a similar character occur also in other animals, including man, after large doses of insulin. There are often premonitory symptoms and in man these are extreme hunger, anxiety, tremulousness, and, later, quickened pulse and sweating. In searching for the cause of these remarkable symptoms we were guided by the observation, made two years previously by Mann and Magath, that the somewhat similar symptoms which develop in dogs after removal of the liver are dependent on the lowering of blood-sugar and can be relieved by injections of glucose. Could the symptoms following insulin be due to the same cause? We very soon found this to be the case, the evidence being, partly, that they usually supervene in normally fed animals when the blood-sugar has fallen to about 0·045 per cent. and partly that they are removed immediately by the addition of glucose to the blood either by administering this sugar subcutaneously or by causing it to be liberated in the body from glycogen, as by the injection of adrenalin. It was found, moreover, that of all the sugars glucose alone has an immediate and lasting effect, even lævulose and galactose, which are its nearest neighbours, having only a slight and transitory action. The symptoms, therefore, are related to a reduction in the concentration of glucose in the blood and must be dependent upon the consequent lowering of free glucose in certain of the tissues; to a condition of glucatonia, we may call it. Why this should be associated with the development of symptoms which are evidently due to abnormal stimulation of the nerve centres that control muscular action is difficult to explain. It looks as if some toxic substance had developed, whose formation is ordinarily prevented by the presence of free glucose, or it may be that a certain tension of free glucose is essential for the chemical interchanges that are associated with the physiological functioning.

of the cells, particularly those of the nerve centres. The close similarity of many of the symptoms with those observed in anoxæmia suggests the possibility that interference with the processes of intracellular oxidation is really responsible for the symptoms, and this view is fortified by the fact that the arterial blood becomes intensely venous in colour when the symptoms supervene. Whatever may be their immediate cause, the discovery that the symptoms are related to hypoglycæmia and can be antidoted by glucose proved to be of great practical importance, for it sounded a note of warning in the use of insulin on patients and it provided a certain remedy should similar symptoms supervene as a result. Possibly, also, it explains in part at least the cause for the toxic symptoms on account of which previous observers, such as Zuelzer, had been compelled to abandon their investigations of the value of extracts of pancreas in the treatment of diabetes in man.

Although the symptoms commonly occur in well-fed animals when the blood-sugar is about 0·045 per cent., they may fail to be observed until a much lower level has been reached. This is particularly the case when a large dose of insulin is given some time after food. The liability of symptoms to occur at about 0·045 per cent. of blood-sugar has served as a useful basis for measurement of the dosage of insulin, one unit being defined as the amount which can lower the blood-sugar to the convulsive level of 0·045 per cent. within four hours in rabbits weighing about 2 kg. Since this "physiological" unit, as it is called, is said to be stronger than is necessary for certain clinical purposes it has been decided for the present to use, as the "clinical" unit, one that is one-third the above strength. This question of the physiological assay of insulin is receiving much attention at present.

Cause of Reduction in Blood-Sugar.

These observations clearly pointed the way to the next problem—namely, the cause for the lowering of the blood-sugar. At first it seemed as if this should soon be solved, for, as already mentioned, it had been found by Banting, Best, and Collip that insulin not only causes glycogen to be deposited in the liver of diabetic animals when sugar is given, but also causes the respiratory quotient to become raised in a manner to indicate that there is increased combustion of carbohydrate. It seemed likely that stimulation of the same processes in the normal animal under insulin must be responsible for the disappearance of glucose from the blood. But the experimental evidence goes to show that the mechanism of action is much more complex. Glycogen is certainly not formed when insulin is given to normal animals (McCormick, Macleod, O'Brien, and E. C. Noble); indeed, it is decreased in amount[2] (Dudley and Marriam), and no certain evidence can be obtained from respiratory experiments that more active combustion of glucose is a necessary accompaniment of the lowering of blood-sugar. The consumption of oxygen greatly increases in dogs preceding the onset of symptoms, and the respiratory quotient usually becomes somewhat raised (Dixon, Eadie, Macleod, and Pember), but in mice changes of an opposite character occur (Dudley, Laidlaw, Trevan, and Boock), and in rabbits they are at first like those in dogs, though less marked, and subsequently like those in mice. The glucose which disappears is apparently neither oxidised to carbon dioxide and water nor polymerised into glycogen. For the present the problem is unsolved, but we must not lose sight of the possibility that insulin changes both glucose and glycogen into some intermediary product which we fail to identity with our present methods of analysis either because it does not give the reducing reactions upon which the detection and estimation of sugars depend, or because it is not precipitated by alcohol after treatment with strong alkali, which is the characteristic property of glycogen. That such substances may exist in the tissues is indicated by the fact that it is impossible after injecting large amounts of sugar into animals to recover much more than one-half by chemical analysis of the entire body.

Acts in the Tissues, not in the Blood.

Whatever may be the nature of the mechanism by which the blood-sugar becomes lowered there is no doubt that it acts in the tissues and not in the blood itself (Eadie and Macleod). Thus, the addition of insulin to blood incubated outside the body does not alter the rate at which the sugar disappears from it, and when the isolated heart is perfused with a suitable saline solution containing sugar the addition of insulin to the solution causes this to lose its sugar more rapidly (Hepburn and Latchford).

The hypoglycæmic effect of insulin lasts for a period which varies in different animals. In rabbits the blood-sugar often begins to rise again in about an hour after the injection, but this depends very largely on the amount of glycogen which is stored in the liver. This becomes converted into glucose to replace that lost from the blood, so that well-fed animals show much quicker recovery, and can withstand much larger doses of insulin, without the development of symptoms, than those previously starved. This mobilisation of the carbohydrate reserves would appear to depend on the transmission to the liver through its nerve-supply of messages set up by the hypoglycæmic condition, for Burn has shown that if the nerve pathway (splanchnic) be blocked by the drug ergotonine, insulin causes in well-fed animals more profound a degree of hypoglycæmia than otherwise. The importance of the glycogen reserves in combating the hypoglycæmic effects of insulin warns us that we must be careful in giving it to diabetic patients in whom, as we have seen, these are abnormally low.

OTHER PHYSIOLOGICAL PROBLEMS.

Numerous other problems relating to the physiological action of insulin are being investigated, but time will not permit of more than a brief allusion to one or two of them. One is its effect on hyperglycæmia due to other causes than removal of the pancreas. These include administration of glucose either by mouth or parenterally—exogenous hyperglycæmia we may call it—and increased production of glucose from the glycogen stores of the liver—endogenous hyperglycæmia. This increased breakdown of glycogen may be brought about by a variety of experimental conditions which are conveniently classified as nervous and asphyxial. Under the former category are included puncture of the floor of the fourth ventricle of the medulla and stimulation of the sympathetic nerve-supply of the liver, either electrically or by the injection of epinephrin; and under the latter, besides the various forms of asphyxia itself, the effect of numerous drugs such as the anæsthetics. So far as it has been investigated insulin is capable of preventing the development of hyperglycæmia in all these conditions. Most attention has been paid to its effect on the hyperglycæmia due to epinephrin, partly because of the possibility that insulin may be assayed by determining the amount necessary to antidote a known amount of epinephrin, which itself can be accurately assayed, and partly because an investigation of the physiological antagonism between these two hormones may throw some light on the mechanism of the action of insulin. Let me give one example to illustrate. We have seen that insulin causes the glycogen stored in the liver to become less in amount, acting in this regard like epinephrin, although probably much less quickly. When insulin is given along with epinephrin, however, much more glycogen disappears from the liver much more slowly than with epinephrin alone, indicating that under certain conditions the pancreatic hormone arrests rather than stimulates the breakdown of glycogen (E. C. Noble). When these two hormones are in excess in the body the one prevents the other from causing glycogen to disappear. Another curious result of a somewhat similar nature has been obtained by Burn with pituitrin, a hormone derived from the pituitary gland. When it is given along with epinephrin it prevents hyperglycæmia, and when it is given with insulin it prevents hypoglycæmia. I have mentioned these results to indicate the very puzzling nature of the problem of the action of insulin and to show that this action may possibly be linked with that of other hormones in the animal.

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[2] This disposes once and for all of the suggestion that the hypoglycæmia is due to a shutting-down of the production of glucose from the liver, which is further confirmed by the observation of Mann and Magath that insulin has its usual hypoglycæmic effect after removal of the liver.

Another interesting effect of insulin is on the peculiar form of experimental diabetes caused by the drug phloridzin. Glycosuria occurs without there being any increase in the blood-sugar and the oxidation of carbohydrate becomes interfered with, as revealed by a failure of the respiratory quotient to respond to the ingestion of sugar. Now, it is significant, as S. U. Page has found, that when insulin is given along with sugar to dogs completely under the influence of phloridzin the respiratory quotient becomes decidedly raised and the glycosuria lessened.

Whatever the mechanism of the action of insulin may be, it is important to bear in mind that the direction of its control of carbohydrate metabolism is apparently not the same in the diabetic as it is in the normal animal, for in the former it causes increased formation of glycogen and greater combustion of glucose, whereas in the latter it inhibits the former process, if not indeed exciting glycogenolysis, and it does not necessarily stimulate the combustion of glucose. Where there has been a deficiency of insulin for the physiological control of carbohydrate metabolism, as in the diabetic, its replacement, by injection, causes those intermediary products of carbohydrate metabolism which have accumulated in the body because of its absence to be immediately transformed. Insulin oils the halting machinery of carbohydrate metabolism in diabetes and allows it to *run smoothly* again, but it interferes with the action of this machinery when it is given to a normal animal in whom there is already a sufficient supply of it for all physiological purposes.

CHEMICAL NATURE OF INSULIN.

Little is as yet known regarding the chemical nature of insulin. Many of its reactions are similar to those given by protease, an early digestive product of protein. This probably explains why it is so readily destroyed by the ferments of the pancreas and stomach and cannot be successfully given by mouth. In the purest preparation from ox pancreas all of the characteristic colour reactions of protein are absent except the biuret reaction. It contains no phosphorus or carbohydrate but a large percentage of sulphur. This would seem to indicate that it must be some low form of protein, although it is possible that it may not belong to this class of bodies at all but be some simpler substance with protein derivatives attached to it as impurities. In this connexion it is significant that very active insulin has been prepared from the pancreas of the skate in which the biuret test could not be obtained. With regard to its solubilities, upon which, of course, its isolation depends, neutral alcohol up to about 80 per cent. dissolves it, so also does water, but it is precipitated in very weak acid (pH 4–6), and in the presence of high concentration of neutral salts. It is also precipitated by such reagents as picric and benzoic acids and it forms a salt with hydrochloric acid. The Collip process for its isolation in a state of sufficient purity for clinical use depends on dissolving it out of the macerated pancreas by weak (60 per cent.) alcohol, evaporating the extract to small bulk in vacuo, removing foreign proteins by stronger alcohol (80 per cent.), and fats by centrifuging or by ether, and finally precipitating the insulin by increasing the alcohol to 90–92 per cent. Further purification can then be effected by re-precipitating either by very weak alkali (Shaffer-Doisy method) or by means of picric acid (Dudley method). In faintly acid reaction it withstands heat, for example, such a solution can be continuously boiled for over an hour without perceptible deterioration, but in faintly alkaline reaction heat soon destroys it. It does not dialyse in faintly acid reaction in which also it is readily adsorbed by charcoal and kaolin. These facts are sufficient to show that insulin is a substance of complex chemical structure, which indicates that its isolation in a chemically pure state will be a matter of great difficulty. Its preparation by synthetic means is therefore at present out of the question.

Finally, let me say a word concerning the insulin-like substances which have been prepared by Collip's process from numerous sources such as yeast and fungi. Most of these differ from insulin prepared from the pancreas of mammals or from the principal islets of the bony fishes in that they only slowly reduce the blood-sugar; indeed, this effect may be delayed for a day or so. The possibility therefore exists that they merely act by stimulating the production of insulin from the pancreas, and if this be the case they can scarcely be of much value in the treatment of diabetes.

BACTERIAL INFECTION OF THE URINARY TRACT IN INFANCY AND CHILDHOOD.*

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BACTERIAL infection of the urine occurs from earliest infancy throughout childhood, and cases presenting such infection must appear to all of you general practitioners at some time or other. My own experience is that, owing to the variety of symptoms which arise, that it frequently goes undiagnosed or is mistaken for a number of other complaints. The urine of infants and children may be the habitat of various bacteria, amongst which I may mention the staphylococci, streptococci, *B. coli*, *B. typhosus*, *B. proteus*, *B. pyocyaneus*, *B. tuberculosis*, and *B. diphtheriæ*. Of the diseases associated with these bacteria, typhoid is becoming rare in this country, and in only a small percentage of cases is *B. typhosus* recovered from the urine. Similarly, while certain types of tuberculosis are common in childhood, an infection of the urinary tract alone is rarely seen. Of all these infections by far the most common is that by *B. coli* alone, or in conjunction with the staphylococcal or streptococcal group.

Apart from infections where an organism can be isolated, we have that large group of nephritis cases, some of which follow the specific fevers, such as scarlet fever and pneumonia, or are syphilitic in origin, and a still greater number, so-called idiopathic, all of which are admittedly infective, but in the greater number of which it has as yet been impossible to isolate the causal agent. The infective nature of the last group, which at one time we were willing to attribute to chill, is well shown by the following experience I had recently when I was asked to see a family of three small boys, all of whom had nephritis. There was no antecedent history of any infectious illness or sore throat; the second boy was taken ill five days after the first, the third some seven days later. In each case there was acute nephritis with hæmaturia, albuminuria, and casts. Cultivation, however, of a sterile specimen of urine yielded no results, despite the apparent infectivity of this disease from one child to another. I do not propose to deal any further with this class of uncertain origin, but will confine my remarks to that in which it is possible to isolate an offending organism. And of these organisms I propose only to deal with the *B. coli* alone or in conjunction with the staphylococci or streptococci.

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* A paper read before the Lincoln Medical Society.

Infection of the urine by the *B. coli*, staphylococci, and streptococci occurs either as a primary disorder or as a complication in some other general systemic infection, as a sequel of diarrhœa and vomiting or chronic constipation, as a secondary infection in congenital malformations of the kidneys, or with renal or bladder calculi, in meningeal states, and in cases where there has been immobilisation in plaster for a long period for spinal and hip disease. Finally, it must be remembered that any of these organisms may be present in the urine without there being, of necessity, any corresponding signs of inflammation of the urinary tract or any disturbance of health. We have then to consider this condition under these headings: (1) Bacterial infections without pathological changes in the urine, stone, or complicating other diseases; (2) bacterial infections, a primary disorder, with pathological changes in the urine; (3) bacterial infections, complicating other diseases and giving rise as well to pathological changes in the urinary tract.

Bacterial Infections without Pathological Change in the Urine.

Cases falling under this heading are of three classes: (*a*) those infants and children who at one time have had a definite acute infection but have since developed an immunity to their infection without actually freeing their urinary tract from the invading organism; (*b*) infants and children possibly possessing a natural immunity to the organism in question; and (*c*) cases in which the organism present is merely a terminal infection in the cause of some other fatal disorder.

These three classes require little explanation. Of the first I shall have something further to say under the heading of prognosis. The second should be clear to the understanding when we compare such a state with other systems of the body. For instance, pneumococci and other organisms abound in the respiratory tract, but we are fortunately not all of us the subjects of pneumonia. In like way the presence of *B. coli* in the urine does not necessarily foretell a certain pyelitis or pyelonephritis unless the resistance and natural immunity is lowered by some extraneous cause. Possibly to this type belong a limited number of cases of enuresis. Hyperacidity of the urine has been instanced as a cause of incontinence in childhood, and a highly acid state of the urine is a concomitant of *B. coli* infection; moreover, in a few such cases with enuresis *B. coli* has been isolated in limited numbers without there being any evidence of inflammatory changes in the urinary tract. Under the third type we have cases where, in a prolonged or fatally terminating illness, a routine examination of the urine reveals *B. coli* or cocci without evidence of pus cells or albumin; such cases, as one would expect, occur more frequently amongst girls than boys, and should be looked upon as a direct contamination of the content of the bladder by soiling of the vulva by fæces, while the child is unconscious and incontinent. The only important point in these cases is not to overlook the primary diagnosis or confuse it with a real *B. coli* infection.

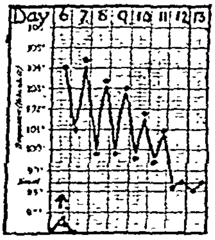
Bacterial Infection with Pathological Changes in the Urine.

We now come to the second heading—*B. coli* infection as a primary disorder with evidence of inflammation and pathological changes in the urine. Theoretically we can divide this group into three subdivisions according as the symptoms denote: (1) a bladder infection or cystitis; (2) a pyelitis or inflammation of the pelvis; (3) a nephritis or inflammation of the kidney substance, which in extreme cases may be suppurative. In practice, however, any two or all three may be equally or to a lesser degree affected at one and the same time. On the whole, the symptoms will vary as to which portion of the urinary system is to the greatest degree involved. Thus, where the bladder is attacked, we have frequent and painful micturition; the urine is cloudy and foul-smelling, and contains quantities of pus and albumin, and occasionally blood. In such cases there may be a mixed infection with staphylococci or streptococci. Pyrexia, on the whole, is absent or only slight. The constitutional symptoms apart from the urinary discomfort are, as a rule, negligible.

In pyelitis, on the other hand, there is, as a rule, distinct constitutional upset. And it is this type of case which frequently goes undiagnosed or wrongly diagnosed.

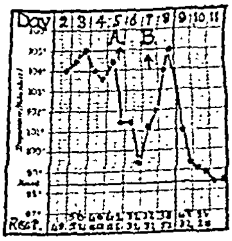
In infancy the onset of the disease is often insidious and is marked by general malaise, anorexia, fretfulness, irritability, pallor of an earthy type, and a rise of temperature, or daily rises of temperature associated with shivering or definite rigors. Such rigors are almost pathognomonic of *B. coli* pyelitis. Dysuria and incontinence or frequency are difficult to determine in young infants, and if present are usually not very marked symptoms, so that the direct relation of the illness to a urinary infection is not always apparent. In older children the onset may be sudden with vomiting, acute abdominal pain, high temperature, and in both infants and children a markedly increased respiratory rate. Frequency of micturition or some dysuria may or may not be present. Frequently the child is drowsy with face flushed, eyes bright, and manner apathetic, suggesting typhoid. In others the increased respiration gives rise to a suspicion of pneumonia. In a third type the mental aspect—drowsiness and sometimes in severe cases, head retraction, delirium, and other symptoms of meningismus—give rise to a suspicion of meningitis. There may be tenderness in one or other loin and, if the pain persists, some enlargement of kidney may be felt; otherwise the condition suggests an acute appendicitis. In infancy the attack may be heralded by some upset of the bowels, such as diarrhœa. In older children constipation before or during the attack is of common occurrence. In two cases of this disease I have noted some enlargement of the spleen suggestive of a systemic infection, and in infants some general bronchitis or even a supervening broncho-pneumonia is not uncommon.

CHART 1 (CASE 1).



A = Date of identification of *B. coli* infection and administration of alkalies (pot. cit., 10 gr., four-hourly).

CHART 2 (CASE 2).



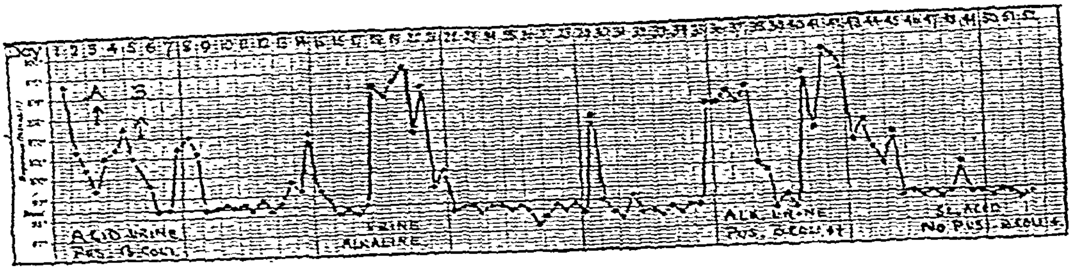
A = Diagnosis corrected to *B. coli* pyelitis; alkalies commenced. B = Dose of alkali doubled.

CASE 1.—A girl, aged 6 years, admitted with five days'
history of pain in left side of abdomen, *frequency of mictur-*
tion, drowsiness, constipation, and fever; urine intensely
acid, containing a trace of albumin, a quantity of pus, and
B. coli. The chart exemplifies the continued *fever type* of
the disease, abated on the eleventh day by administration
of alkalies. Diagnosis: acute pyelitis. *Recovery complete*
(Chart 1).

CASE 2.—A female infant, aged 10 months, admitted with
cough, vomiting, and diarrhœa. On *admission face flushed*,
respiration rapid, high temperature. Provisional diagnosis:
pneumonia, which was rapidly disproved by complete
freedom of lungs from physical *signs and* presence of
albumin, pus, *and B. coli* in large numbers in the urine.
Rapid recovery on alkaline treatment. Chart 2 illustrates
confusion of disease with pneumonic states and shows
rapid defervescence of temperature when large doses
of alkalies (pot. cit. 30 gr., sod. bicarb. 20 gr.) were
administered.

CASE 4.—Girl, aged 7½ years, admitted semi-conscious and delirious, with great mental irritability, and incontinence of urine and fæces. Tache cérébrale well marked, Kernig's sign, onset sudden. Sent to hospital as meningitis. Previous history of enuresis for two years, following a severe attack of whooping-cough. Urine acid, trace of albumin, pus cells, and *B. coli* in profusion. Chart 3 shows persistent recurrent fever in spite of treatment, and exacerbations whether urine is acid or alkaline. After ten weeks in hospital the child was discharged with urine free from pus and albumin, but *B. coli* were still present on cultivation. Two months later she was again readmitted with a recurrence of all symptoms and pus in the urine. The previous enuresis suggests a latent and long untreated chronic infection.

CHART 3 (CASE 4).



A = Alkali, 30 gr., six-hourly. B = 60 gr., four-hourly.

CASE 6.—Boy, aged 1 year, admitted with pneumonia. In the course of convalescence he developed a high temperature with rigors. Urine found to contain pus, albumin, *B. coli communis*, and *Staphylococcus aureus* and *albus* in large numbers. Complete recovery with alkalies.

The temperature chart in this disease is worthy of some further consideration. A series of charts herewith illustrate different types of the disease. In certain cases the disease may be apyrexical throughout, in others the fever is high and maintained, as in typhoid or pneumonia; in others the charts are distinctive of the disease, as in the "malarial" type, with signs which occur in infancy (Chart 6) or in the recurrent type of fever which is prevalent in the more chronic relapsing cases in older childhood (Chart 4). There is not one showing a condition of long-continued fever, but it is quite easy to imagine that such might be the case in at least one of these, if treatment had not abated the infection (vide Charts 1 and 2). The urine in both infancy and childhood in these cases of pyelitis is highly acid, contains a small quantity of albumin, a variable number of pus cells, and a profusion of organisms which exhibit the morphological and cultural features of *B. coli*.

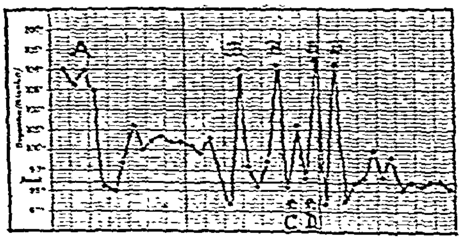
Evidence of infection of the kidney by *B. coli* is shown in some cases by profuse hæmaturia; in others the picture is identical with that of acute idiopathic nephritis; the urine being smoky, containing blood, pus, albumin, and rarely a few casts, and culturally *B. coli*. There may be some œdema and pallor in these cases, but more frequently there is no œdema and no evidence of anæmia. In a few rare instances suppuration occurs in the substance of the cortex of the kidney. These cases are fatal. In the only one I remember to have seen the symptoms were pallor, semiconsciousness, gradually increasing to coma and death. A diagnosis of meningitis had been made, but an examination of the cerebro-spinal fluid yielded neither any cellular increase nor pathogenic organism, while the urine showed pus cells and *B. coli*. Post mortem a number of small yellow abscesses were visible in the cortex. Such is a brief clinical picture of *B. coli* infection of the urine in infancy and childhood.

Bacterial Infections Complicating Other Diseases and also Giving Rise to Pathological Changes in the Urinary Tract.

We now come to our third group—namely, *B. coli* infection grafted on to some other disorder as a complication. While the diagnosis of a primary *B. coli* infection is not always easy, the addition of such to some other fever or disease often produces a most bewildering and confusing picture, and it should be remembered that the incidence of this disease during the course of other illnesses is no rare occurrence. Conditions which (1) lower the general resistance, or (2) in any way implicate the gastro-intestinal tract or cause abrasion of the latter, appear to facilitate the passage of *B. coli* from its intestinal residence to a fresh area in the urinary tract. Thus, on the one hand, we see it complicating the termination of an attack of pneumonia, as in Chart 6, and on the other the convalescence of typhoid. Whenever it happens the symptoms already mentioned follow or are merged with those of the original infection.

Probably the greatest difficulty will arise where a *B. coli* infection is implanted on some other kidney trouble or some malformation of the kidney. Recently I was asked to see an infant who had failed to gain in weight and suffered from recurrent attacks of diarrhœa and sickness, despite the most careful feeding. A temperature chart showed recurrent attacks of fever, not always coincident with the intestinal derangements, and in two of these attacks there had been definite rigors. Examination of the urine showed pus cells and *B. coli* and a trace of albumin; the child was of the usual pallid, fretful type which one associates with a prolonged *B. coli* infection, and as a consequence a diagnosis of pyelitis was made with some assurance and hope of successful recovery. Three or four weeks later, however, the child died in a state of uræmic convulsions, and post mortem we found double congenital hydronephrosis with a superadded *B. coli* infection.

CHART 4 (CASE 6).



A = Crisis of pneumonia. B = Rigor. C = Date of identification of *B. coli* infection. D = Beginning of alkali treatment.

Prognosis.

The next question that arises is, What is the ordinary progress of this disease and of what nature is the prognosis?

Cases of *B. coli* infection fall roughly into four groups: (1) Those having an initial acute attack which reacts to treatment with complete subsidence of symptoms and freedom from *B. coli* in the urine.

(2) Cases which recover from their initial attack, but though devoid of fever and constitutional symptoms continue to show the presence of *B. coli* in the urine. Such cases are liable to relapse and present acute symptoms again on any deterioration of health reducing their acquired immunity. (3) A recurrent chronic type, not reacting to treatment and not developing any immunity. Such cases drag on for months and years with variable periods of ill and good health. 4. Fatal cases, which are rare. In these there is, as we have already pointed out, renal suppuration. Such cases are resistant to treatment and gradually sink and die uræmic.

The prognosis in this disease depends, as in most medical disorders, on early diagnosis and efficient treatment. Delay in either one or the other tends to chronicity; once well implanted, this infection is exceedingly difficult to eradicate.

Treatment.

Treatment resolves itself into:—

1. Rest in bed.
2. Liquid diet with plenty of bland fluids.
3. Attention to the bowels. Correction of constipation, the arrest of any diarrhœa or morbid processes in the bowel, and the administration in any case of some regular intestinal antiseptic.
4. The exhibition of drugs, of which by far the most valuable are simple alkalies, such as pot. cit., sod. cit., or sod. bicarb. These must be administered in large doses; 10 to 15 gr. of the former can be safely given every two hours to an infant of 1 year for a short period, and then given four-hourly and six-hourly until all pus and *B. coli* have disappeared, or mixtures of pot. cit. and sod. bicarb. may be used. Continuation of this treatment is generally recommended until all constitutional symptoms have subsided and the urine is alkaline. Now I would state that subsidence of constitutional symptoms does not imply freedom from *B. coli* infection, and that alkalinity of the urine cannot always be attained, even with very large doses of alkalies by mouth—and that, moreover, despite alkalinity of the urine attacks of fever and recrudescences of the disease may still occur. The only real indication of cure is the absence of pus and micro-organisms from the urine. These points are well illustrated in the charts (see Chart 4). Occasionally large doses of alkalies are ill borne, and continued administration unquestionably in many cases produces lack of appetite, general depression, and even vomiting. They should, however, be pressed to the limit of tolerance, and may then be superseded by some urinary antiseptic, such as helmitol or urotropin. I have never seen any real benefit accrue from the use of these substances alone in this disease, except in the case of mixed infections. However, the alternative use of these drugs and alkalies seems at present the best procedure when the disease is protracted in its course.
5. Treatment by autogenous vaccines. With regard to this method, I have personally had very little success. In a few cases I have even believed I have seen harm done, and in the type of case, the chronic recurrent, where one most desires assistance, it has in my hands proved useless.

The question of mechanical interference, such as lavage of the bladder, is one to be carefully considered. In mixed infections this is possibly of value, but in the great bulk of cases and in all pure *B. coli* infections, instrumental treatment should be avoided. Whatever method of treatment is employed, every effort should be made to see that the urine is free from *B. coli* before such treatment and observation is discontinued. Many chronic cases, I am confident, arise from neglect of this simple precaution.

Diagnosis.

The diagnosis of this condition has been to some extent reviewed in discussing the symptoms to which it gives rise. Acute cystitis, due to the *B. coli* alone or to mixed infection of *B. coli* and streptococci, is generally readily recognised by the dysuria and frequency to which it gives rise, and the nature of the infection is readily discovered by microscopical examination of a catheter specimen of urine. Acute pyelitis, however, may give rise to some difficulty unless it is always remembered that unexplained fever in infancy or childhood may have its origin in a *B. coli* infection of the urinary tract. In many of these cases, as I have pointed out, there are few occasions in which the symptoms indicate irritation or inflammation of the pelvis or kidney itself. Where there is acute hæmaturia I have seen the diagnosis of stone made, or rarer conditions such as essential hæmaturia or scurvy, where a simple cultivation of the urine would have shown *B. coli*.

Acute cases with abdominal pain and fever and rapid pulse suggest appendicitis. Continued fever with some drowsiness and irritability suggest typhoid, general tuberculosis, or meningeal conditions. The same with increased respiration, so often seen in this disease, suggests a pneumonia, and I have no doubt that the diagnosis of deep-seated pneumonia is not infrequently made in this disease. A small apical pneumonia and this condition are easily confused, but a strict examination will reveal the first and a catheter specimen of urine the second. Where this condition complicates a pneumonia or arises in convalescence the most natural assumption is to attribute the fever to some empyema formation or an acute otitis media. In Case 6 the patient's chest was explored on more than one occasion on these grounds. Where there are rigors infective endocarditis or septic conditions may be inferred wrongly. The close similarity of the chart to malaria must be confusing in countries where that disease is endemic.

Where the fever is recurrent suspicion will arise of tuberculosis; glandular tuberculosis of the abdomen not infrequently presents a picture with this characteristic chart. Rheumatic and nervous children are liable to slight recurring bouts of fever without any very definite physical signs. Tonsillitis in deep-hidden tonsils gives rise to recurrent attacks of febrile disturbance with general malaise.

The mode of entrance of these various organisms, and in especial the *B. coli*, has aroused a certain amount of controversy. The old view was that in all cases infection was of an ascending nature via bladder and ureter to the kidney. The extreme prevalence of this disease in female infants and children was quoted as a proof of this method of ingress. On the other hand, although less common in males, it does occur in that sex, and direct invasion per urethram seems difficult of comprehension on anatomical grounds. Then it was stated that invasion along the ureter against the urinary flow was impossible; this, however, has been proved possible by experiment. It may be assumed, therefore, that in certain cases infection of the bladder at all events may take place from soiling of the vulva by fæces in young children, and it is possible that a secondary infection of the pelvis and kidney results, therefore, by direct spread, such spread being facilitated by possible inflammation of the bladder, obstruction of the ureteric orifice, and stagnation of urine in the ureter.

There are, however, a number of cases in which the predominant and apparently sole lesion is one of pyelitis or pyelonephritis; from these it has been assumed that there is a blood infection, the organism entering the blood-stream and selecting the kidney as its victim, owing presumably to some lowering of resistance of that organ. The general septicæmic state of some of these little patients and its close resemblance under certain conditions to an allied condition, typhoid, suggests that the blood-stream, therefore, is also a path of infection.

Lastly, we have the lymphatic theory of spread of infection; one path being by way of the lymphatics of ureter from the bladder to the kidney, and secondly, directly from the lymphatics of the large bowel to the lymphatics of the capsule of the kidney.

PULMONARY AMŒBIASIS.

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IN most cases amœbic infection of the lung is due to direct extension of a previously existing hepatic abscess through the diaphragm. Cases of this nature are well known, but their recognition at any early stage after rupture is necessary in order that specific and efficient treatment may be immediately installed. Abscess of the lung due to *Entamœba histolytica* can occur quite independently of abscess of the liver, though seldom recognised during the lifetime of the patient. It is with this aspect of pulmonary amœbiasis that I mainly wish to deal in the present paper.

In the older literature in the case recorded by Colin[1] in 1873, ten abscesses of the lung had arisen secondary to a thrombus in the liver, and in another reported by Moxon[1] the liver abscess had actually burst into a sub-hepatic vein, and thus spread to the lung. In this first condition, which may be termed primary pulmonary amœbiasis, the route by which the entamœbæ gain the pulmonary circulation is probably the one described by Bunting[2] (1906)—that is, by direct embolism through the circulation from the colon. In this case firm consolidated nodules were found in the lung in which entamœbæ were demonstrated in section. In another described by Opie[3] in 1901 a large amœbic abscess was found in the right lung, together with an evidently healed amœbic abscess of the liver. Tuffier[4] in his paper evidently recognised the condition during life, and the patient is reported to have been cured by operative interference. In this case the abscess was present in the right lung; hæmoptysis, fever, and other symptoms were present, but no assistance could be obtained from radiography in arriving at a diagnosis. Loison[5] reported a similar instance and suggested aspiration of the pus, the point of the needle being directed visually through a radioscopic screen, which in a radiographic report by Herold[6] seems actually to have been accomplished, for in the figure reproduced the outline of the abscess can be quite clearly seen below the angle of the right scapula. In this instance hæmoptysis was present and bodies were found in the sputum which resembled degenerate entamœbæ. The patient subsequently developed an hepatic abscess. Simonin[7] reports an autopsy in which two abscesses were situated in the right lung, quite separate and independent from three abscesses in the liver. Macfie[8] in Accra also has found amœbic abscess of the lung associated with a similar condition of the liver at autopsy. Quite recently Ramond,[9] Denoyelle, and Lautman have recorded an interesting case where multiple pulmonary abscesses without ascertainable involvement of the liver were recognised during life and where all symptoms disappeared after exhibition of emetine.

Primary Pulmonary Amœbiasis.

Three striking instances of what *appear to be primary* pulmonary amœbiasis caused by infiltration of the lung by *E. histolytica*, quite independent of liver abscess, have recently been met with in hospital practice. All three cases have responded in a dramatic and striking manner to emetine therapy.

CASE 1.—An ex-soldier had served in India during the war and had suffered from dysentery in 1918, with subsequent relapses treated with emetine (presumably amœbic in origin) was admitted into hospital on March 12th, 1921. He was then complaining of intermittent pain, acute at times, in the lower chest on the right side. For the last 14 days he had been troubled with cough, accompanied by fever and some respiratory distress; the number of respirations averaged 26–28 per minute. The sputum was profuse and purulent in character, but there had been no hæmoptysis. The patient was evidently ill, pallid, and emaciated, weighing 112 lb. Pyrexia was intermittent, varying between 101° and 102° F.; nocturnal perspiration was profuse. No clubbing of the fingers was noted, or any "shoulder pains."

At first hepatic abscess was suspected, as the patient had suffered from dysentery and there was a leucocytosis of 14,000; however, the fæces were frequently microscopically examined for *E. histolytica* cysts with a negative result. There did not appear to be any special involvement of the liver. In fact, the pain was situated above the hepatic area and pulmonary signs were sufficiently apparent. There was a patch of dullness to percussion, some 4 inches in diameter, below the angle of the right scapula when the breath sounds were bronchial and an occasional expiratory crepitation could be distinguished. Similar, but smaller, broncho-pneumonic areas became apparent from time to time after frequent examination at the lower lobe of the left lung. The sputum, which contained numerous pus and large epithelioid cells, was frequently examined for tubercle bacilli without avail.

In view of the possible involvement of the liver, the organ was aspirated without result; no improvement in the pulmonary signs were noted, and the pyrexia remained the same as before. The diagnosis then varied between a simple or tuberculous broncho-pneumonia and the consensus of opinion was in favour of the latter, and one month after admission and six weeks after the commencement his condition had become steadily worse. Purely on empirical grounds and the possibility of amœbic involvement of the lung, emetine injection (1 gr.), together with pulv ipecac. 10 gr., were commenced on April 11th, 1921. An immediate and striking improvement was noted (Chart 1); the pyrexia, which had persisted for the previous six weeks, resolved in four days; the broncho-pneumonic signs disappeared and the patient's general condition improved to such an extent that he was discharged on May 18th in apparent good health. He received altogether 260 gr. of pulv. ipecac. During the course of his acute illness he had become emaciated, and he rapidly regained weight up to 140 lb.—an increase of 28 lb.

CASE 2.—An ex-soldier, who had served in Mesopotamia, was admitted on May 10th, 1921, shortly after the discharge of the first case. He also had suffered from dysentery contracted in 1919 and had experienced numerous relapses, for which he had been treated with emetine. In August, 1920, during one of these relapses, he was admitted to the Hospital for Tropical Diseases with clinical signs of dysentery, and for which he was treated with emetine bismuthous iodide. No entamœbæ were found in the fæces, but the sigmoidoscopic appearances were characteristic of amœbic infection.

A fortnight after admission he commenced to suffer from pyrexial attacks with "shivering fits," broncho-pneumonic symptoms, nocturnal perspirations, profuse purulent expectoration, but again no hæmoptysis. Respiratory distress was evident and the number of respirations averaged 24 per minute. The patient's general condition was decidedly poor, perspiration was profuse and evident, emaciation extreme (weight 114 lb.), skin tense and dry, and the general condition of the patient and the remittent pyrexia (T. 102° to 103° F.) certainly suggested at first sight miliary tuberculosis. On examination numerous crepitations and fine sibilant rhonchi were apparent evenly diffused over both lungs. By light percussion small scattered and indefinite patches of dullness could be distinguished, but there was nothing to suggest any involvement of the liver. There was a slight leucocytosis of 9000; the fæces contained no *E. histolytica* cysts; the sputum numerous pus and epithelioid cells, but no entamœbæ (which were specially looked for).

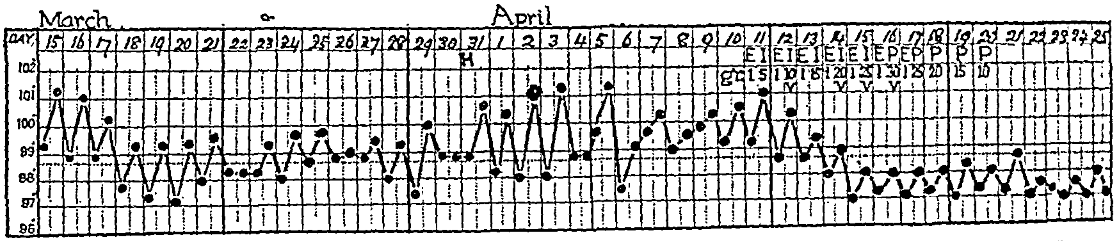
Some three weeks after admission the general condition of the patient was worse, and the suggestion of miliary tuberculosis seemed to receive support. At this time definite rigors were noted, the temperature rising suddenly with profuse perspirations to 104° F. Two of these rigors occurred during a space of five days.

In view of the case already recorded, emetine injections were instituted, with immediate improvement in the clinical signs and in the patient's condition, as the chart shows (Chart 2). He received in all 16 gr. of emetine, followed by 300 gr. of ipecacuanha spread out in doses of 10 gr. each nightly. The improvement in the condition of the patient was so striking as to be apparent to all. His weight increased by 21 lb., and he was discharged on July 26th, 1921, in apparent perfect health. *He has* suffered from one similar relapse since, for he was readmitted a year later with similar but milder symptoms, which once more speedily yielded to emetine and ipecacuanha therapy.

CASE 3.—A lascar, aged 28, was admitted to the Albert Dock Hospital with a provisional diagnosis of broncho-pneumonia. As the chart indicates (Chart 3) he was in a very distressed condition—temperature 103° F. with orthopnœa, marked dyspnœa, and respiratory distress. The pulmonary signs were most evident at the right base, where a distinct friction rub, bronchial breathing, and crepitations indicated a consolidation of the lung. Within a few days similar signs were audible also on the opposite side. The sputum, which was abundant, purulent, frothy, and streaked with blood, contained pus and epithelioid cells, scanty pneumococci, but no T.B.

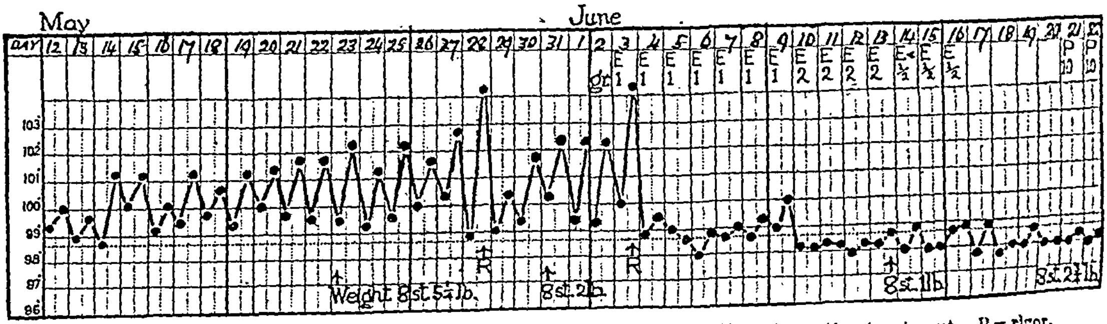
The patient's evident anæmia could be attributed to a concomitant ankylostome injection as the ova were present in the fæces. A high leucocytosis of 94,000 was present, and this figure seemed to indicate that in this case one was not dealing with either a tuberculous broncho-pneumonia or the usual type of broncho-pneumonia commonly encountered in this class of patient. There was slight thickening of the sigmoid colon, but otherwise no evidence of a recent amœbic infection.

CHART 1.



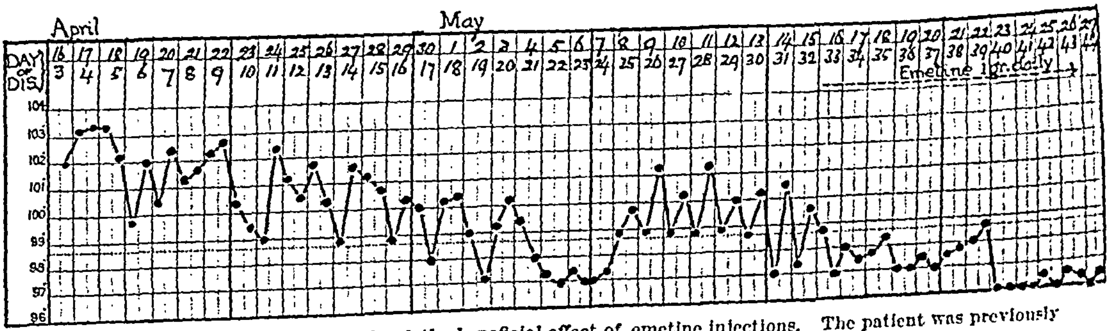
CASE 1.—Showing resolution of pyrexia in four days after injection of emetine. H = hypodermic injection of influenza vaccine. E = emetine. I = ipecacuanha. P = pil-ipecac. V = vomiting.

CHART 2.



CASE 2.—Another illustration of immediate improvement after institution of emetine treatment. R = rigor.

CHART 3.



CASE 3.—A third striking example of the beneficial effect of emetine injections. The patient was previously in a very distressed condition.

At the end of the third week in hospital, when treated on empirical lines, the condition had not in any way improved, and signs of a patchy pneumonic consolidation were present throughout both lungs; it was then decided to try the therapeutic effect of emetine (Chart 3), with instantaneous and striking effect. The results of this treatment (emetine 11 gr.), followed by a course of pulv. ipecac. 5 gr. daily for 14 days, appear to have been permanent. On July 7th he returned to his ship in good physical condition, having gained over 28 lb. in weight.

The diagnosis in these cases was arrived at by a process of exclusion, by their previous history of amœbic infection, by the marked leucocytosis, and by observing the instantaneous and almost miraculous effect of emetine therapy.

From an ætiological standpoint it would have been more satisfactory to have found *E. histolytica* in the sputum, but from the nature of the lesions, which probably, as in Bunting's case,[2] are composed of consolidated broncho-pneumonic nodules, I do not believe this to be possible. No assistance was obtained in aiming at a diagnosis by the X rays.

My object in publishing this paper is to bring these facts to the notice of tropical workers, as probably these cases are of more frequent occurrence than has been thought to be the case. It is possible that many of the obscure unresolving broncho-pneumonias in natives which one encounters in hospital practice, especially amongst lascars, are really of this nature.

Pulmonary Amœbiasis Secondary to Liver Abscess.

The bursting of an unrecognised liver abscess into the lung may produce the most varied pulmonary signs, and it is not surprising, when such an accident occurs, that the physician is led to diagnose various pneumonic conditions, such as bronchiectasis, tuberculosis, or unresolving pneumonia. It may happen that the original hepatic abscess produced no symptoms whatever, and therefore remained unrecognised till the rupture had taken place.

CASE 4.—A regular soldier, a staff-sergeant in the R.F.A., first went to India in 1909. In December, 1911, he became ill with dysenteric symptoms, and phlebitis of both legs. Later he is said to have suffered from pneumonia, but the liver was aspirated under an anæsthetic, evidently on the suspicion that an abscess existed. In May, 1913, he was transferred to the United Kingdom and invalided out of the Service on account of continual pyrexia and recurrent attacks of phlebitis.

Apparently thrombosis of the veins began in the left leg, causing great pain and spreading via the pelvis into the right. Some three months subsequently compensatory enlargement of the abdominal veins was noted, which gradually formed a large abdominal plexus. He was unfit for service through the whole of the war, suffering from intermittent attacks of pyrexia and phlebitis and secondary ulceration. In February, 1920—i.e., five years and two months after original attack—pleuritic pains in the right side commenced with cough, profuse expectoration, often blood-tinged. The fingers became numb and cold and the terminal phlanges gradually became clubbed.

At that time he was thought to be suffering from pulmonary tuberculosis, and an unfavourable prognosis was given. Admitted to hospital on Nov. 8th, 1920, he was found to be in a distressed condition, harassed by constant cough, expectoration, and pain in right side. The temperature was hectic in type, emaciation was extreme, and the sputum was profuse, frothy and purulent, tinged from time to time with dark blood. In amount it varied from one to three pints in the 24 hours. This expectoration was usually brought up after an explosive coughing fit, and excited by change in posture; it was noted that bending to the left side was apt to initiate such a spasm. The clubbing of the fingers and toes was evident, and the superficial abdominal veins were varicose.

No evident enlargement of the liver was revealed by a physical examination, but the signs elicited on the right side suggested a considerable involvement of the lung tissue. Impairment of percussion, with diminished air entry and vocal resonance, extended downwards from the third rib. Posteriorly dullness commenced from the seventh space in the scapular line. The sputum contained numerous pus and large epithelioid cells; there was a definite leucocytosis of 14,000, while the fæces contained the cysts of *E. histolytica* in large numbers.

The liver was aspirated under an anæsthetic without result; immediate improvement took place from emetine and ipecacuanha therapy; the cough diminished; the expectoration became less in amount and the lung signs cleared up entirely. The clubbed fingers and toes gradually became normal. He received a total amount of 10 gr. emetine, 160 gr. pulv. ipecac., and 30 gr. emetine bismuthous iodide. After two months in hospital he was discharged as convalescent, having made a satisfactory recovery, with no pulmonary symptoms, and having increased 18 lb. in weight. The sequence of events in this remarkable case would appear to be as follows:—

Primary amœbic dysentery: amœbic hepatitis and formation of hepatic abscess, septic absorption from the abscess cavity and consequent thrombosis of the saphena veins, compensatory venous circulation; rupture of hepatic abscess through diaphragm into right pleura, formation of secondary amœbic abscess of lung, with clubbing of fingers and toes, and respiratory changes.

This man has remained in good health ever since.

CASE 5.—An Englishman, long resident in India, returned to this country on leave in May, 1921. He had been suffering from antral trouble for some time previously, but the present illness began suddenly on August 9th of that year, with what was thought to be an attack of pneumonia. His temperature was intermittent in type, reaching 103° F., profuse perspirations, and the sudden expectoration of purulent fluid containing a considerable amount of dark blood. He became rapidly emaciated and lost over 2 st. in weight, the lowest recorded being 8 st. 13 lb. The amount of expectoration varied very considerably from day to day, apparently being influenced by posture. On admission to hospital on Oct. 10th he was found to have very considerable involvement of the right lung, with a pleuritic rub and diminished air entry; there was also impairment of the percussion note at the left base with sonorous rhonchi and scattered crepitations. The sputum was copious and purulent, averaging about a pint daily and containing large numbers of pus and epithelioid cells, no entamœbæ, but large numbers of yeast cells and branching mycelium. The organisms, cultured by Dr. J. T. Duncan, were found to have the characteristics of the genus monilis, and to be serologically similar, as tested by agglutination and complement deviation, to stock cultures of the thrush fungus. They are of the type commonly isolated by this investigator from fæces. The liver was not apparently enlarged, nor could any evidence of its implication be obtained from an X ray examination. The blood showed a definite leucocytosis of 12,000. The fæces contained no *E. histolytica* cysts. The improvement on emetine injections and pulv. ipecac. was rapid and remarkable, the amount of sputum diminished, and before he left for India in March, 1922, he had gained 47 lb. in weight. He has remained in good health ever since.

The hepatic abscess in this case must have been in the process of formation for some considerable time without producing any obvious symptoms; in fact, its rupture into the lung substance appears to have been the first evidence of its existence. The presence of yeast cells and mycelium in the sputum in large numbers, apparently derived from the lung cavity, is of interest.

One cannot regard the thrush fungus as the cause of the disease, but as being a secondary infection. In a similar manner Monilia often occurs in the sputum of tuberculous subjects, and other debilitated subjects. That this is not the view held by all may be judged by the amount of literature devoted to the condition described by Castellani as tropical bronchomycosis or bronchomoniliasis,[10] about the pathology of which little appears to be known. Castellani says that "the diagnosis of moniliasis is based on the finding of the fungus in the sputum." Adopting this criterion, the case quoted above should have been regarded as a primary infection of the lung with Monilia, and not as a case of pulmonary amœbiasis, as it turned out to be.

Conclusions.

1. Pulmonary amœbiasis may develop independently of hepatic abscess.
2. The pulmonary condition may simulate those of a bronchopneumonia or miliary tuberculosis.
3. The diagnosis is based upon the previous evidence of amœbiasis, the leucocytosis, and the remarkable and lasting response to emetine and ipecacuanha.
4. Rupture of a hepatic abscess into the lung may take place without previous warning or the coexistence of hepatic symptoms.
5. The resulting pulmonary infection may closely resemble idiopathic disease of the lung, such as tuberculosis or bronchiectasis, both in local signs and general effects.
6. The therapeutic action of emetine and ipecacuanha is as striking in this as in the first condition described and, as generally recognised, is more rapid and lasting than in amœbic infections of the bowel.
7. Secondary infection of the respiratory tract with yeast fungi (Monilia) may occur (so-called bronchomoniliasis). This appears to be of little diagnostic and possibly of no ætiological importance.

I am indebted to Dr. J. T. Duncan for his help in the investigation of these cases, and to my senior colleague, Dr. G. C. Low, for his kindness in permitting me to utilise his notes of the third case quoted. Capt. R. L. Sheppard has given me considerable assistance with the scattered literature of this subject.

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GASTROMYOTOMY:

AN OPERATION FOR THE CURE OF CHRONIC ULCER OF THE STOMACH.

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GASTRO-ENTEROSTOMY for the cure of gastric ulcer is out of favour, whether alone or combined with excision or cauterisation of the ulcer. Sir Berkeley Moynihan,[1] in a recent Hunterian Lecture, has stated that its "trivial advantages" are outweighed by its disadvantages, the chief of which is that the relief that follows the operation is frequently only temporary. Most surgeons will agree that the operation is by no means ideal for ulcers in that situation, and will admit the force of the arguments that he brings forward in his advocacy of the very radical operation of partial gastrectomy. The surgical mind, however, cannot contemplate with perfect satisfaction the necessity of having to choose between medical treatment on the one hand and gastrectomy on the other. If no less hazardous and mutilating operation can be devised for the cure of these ulcers, the inevitable tendency will be to postpone surgical intervention and to try medical treatment for longer than would otherwise be the case. But surgeons will continue to search for a simpler and safer operation, bearing in mind, perhaps, that if they can, by such an operation, bring about "a complete subsidence of all symptoms, a permanent freedom from any recurrence of the like disease, and immunity from any disorder associated with the operation"[1] in a *majority* of the cases, the operation of gastrectomy still remains for those few, if any, in whom the symptoms are not relieved or recur. For the operation about to be described it is claimed (1) that it is based on sound physiological principles; (2) that it may fairly be described as a safe and a simple operation; (3) that the results in the few cases in which it has been performed have been good.

The principles on which the operation is based may first be considered.

Cause of the Chronicity of Gastric Ulcers.

Leaving aside the question of the actual origin of gastric ulcer, there is general agreement on three points in connexion with the subject: first, that chronic ulcers are found, in the great majority of cases, in two situations only—on or near the small curvature and on or near the pylorus—while acute ulcers are not so limited in their distribution; secondly, that healing of gastric (and duodenal) ulcers is a common event (Prof. M. J. Stewart[2] has brought forward conclusive evidence on this point from post-mortem examinations); thirdly, that there is no known reason, anatomical or physiological, why ulcers should *originate* in one part of the stomach more than in another. We may draw the inference, therefore, that there is some factor in connexion with the small curvature and the pylorus that delays or prevents the healing of ulcers near these parts. I believe that this factor is to be found in the arrangement of the circular muscle fibres in these parts. In the case of the pylorus there is an easily demonstrable sphincter; in the lesser curvature, the circular fibres that are comparatively thinly spread over the fundus and the great curvature are crowded into a smaller space and set so close together as almost to constitute a sphincter. It is a fundamental principle of pathology that rest is conducive to the healing of a wound, while movement and irritation hinder healing. While no part of the stomach is at rest for any length of time, unless feeding by the mouth is discontinued, and probably not even then, an ulcer originating in a part where the muscle fibres are sparsely distributed, such as the great curvature, has a much better chance of healing than one which happens to start in the sphincter of the pylorus or the small curvature. A fissure of the anus involving the sphincter ani heals slowly, perhaps not at all; when the muscle is divided the fissure heals rapidly, in spite of the septic nature of the material that passes over it. It occurred to the writer that treatment on these lines might allow natural healing to take place in chronic ulcers of the stomach, and that it might prove more profitable to focus attention on the muscular fibres rather than on the gastric juice or on dental sepsis. The operation consists of a division of the circular muscle fibres that pass to the neighbourhood of the ulcer. "Gastromyotomy" seemed a convenient and self-explanatory name for the operation.

Technique of the Operation.

I have performed gastromyotomy only in cases where laparotomy has revealed a chronic indurated ulcer of moderate size in the neighbourhood of the small curvature, uncomplicated by hour-glass contraction and not adherent to the pancreas, though I am not sure that the latter complication would contraindicate the operation. If the ulcer is on the anterior wall of the stomach, a curved incision, about four inches long, with the convexity downwards, is made below the ulcer and sufficiently far from it to be free of indurated tissue; this incision divides the peritoneal coat only. The peritoneum is separated from the muscular coat for about a quarter of an inch on each side of the incision, and the muscle fibres are defined. The incision is then carried down to the muscularis mucosæ, thus dividing all the circular muscle fibres passing to the ulcer-bearing area. This part of the operation is a little difficult, as the fibres are sometimes indistinct and it is easy to penetrate the mucous membrane; should this occur it is sutured before proceeding. The divided muscle fibres are now separated on either side of the incision by means of gauze wiping, and the peritoneal coat sutured by Lembert sutures in such a way that the cut edges of the peritoneum are inverted into the gap that has been made in the muscular coat. I have once or twice cauterised and infolded the ulcer, but am not convinced that there is any particular advantage in so doing. After the usual inspection of the appendix, &c., the wound is then closed. Where the ulcer is on the posterior wall I have exposed the stomach through an opening in the mesocolon and made the incision in the posterior wall of the stomach; but as the muscle fibres appear to be thinner in that situation than in the anterior wall, I have made the anterior incision as well, thereby practically isolating the ulcer as far as the circular muscle fibres are concerned.

As regards after-treatment, patients have been treated much in the same way as those in whom gastro-enterostomy has been performed—salines and glucose for 24 hours, feeds of milk, &c., going on to fish and minced chicken in about a week, and ordinary food soon after. Alkalis have not been given.

Results.

In no case has there been any pain after the operation, nor any vomiting, apart from slight post-operative vomiting. In one patient, in whom even feeds of milk caused pain up to the day of operation, the pain entirely disappeared and has not recurred, though she has been taking ordinary food with good appetite for some months. This has been perhaps the most striking case, for in the other cases careful dieting and medical treatment combined with rest in bed had relieved the pain for a week or so before operation. In one patient, who was markedly anæmic from gastric hæmorrhage, the melæna, which disappeared immediately after the operation, recurred and did not entirely clear up until the twelfth day. In this case the base of the ulcer was very thin and was cauterised and infolded; some leaking apparently occurred and the upper part of the wound suppurated for a few days. There has been no pain or vomiting since the operation and six months after discharge the melæna has not recurred.

One patient complained of occasional attacks of vomiting a month after operation, but in her case permission to take ordinary food was too liberally interpreted, and vomiting has ceased since reasonable care has been taken in the selection of diet. In one case I had occasion to reopen the abdomen two months after performing this operation. The patient was a man of 37, with a three months' history of pain one and a half hours after food, and two recent attacks of hæmatemesis. There was a large ulcer in the anterior wall of the stomach, close to the small curvature and at the junction of the cardiac and pyloric parts of the stomach. There was so much induration around the ulcer that I was suspicious of malignancy, but decided against it. Gastromyotomy (anterior wall only) was performed and for eight weeks there was no pain after food, and the man improved remarkably in general condition and put on weight. He then began to complain of pain, not related to food, but coming on at night; there was considerable delay, one-third of the meal remaining after eight hours, and I began to think that I had made a mistake in not treating the condition as malignant. I reopened the abdomen and found that the extent and degree of the induration had greatly diminished and no longer suggested malignancy; the crater of the ulcer, however, could still be felt, although it was smaller and smoother than at the first operation; there was no sign of any scar where the muscular coat was divided at the first operation. Gastro-enterostomy was performed because of the delay. In an almost exactly similar case, where division of the muscular coat was carried out in both anterior and posterior walls, the result after six months is most satisfactory, and I am inclined to think that the division of the fibres on both sides of the ulcer will prove to give better results than on one side only.

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[1] THE LANCET, 1923, i., 221.
[2] THE LANCET, 1922, ii., 1164.

Rôle of Gastro-enterostomy in Gastric Ulcer.

There is no doubt that the results of gastro-enterostomy for gastric ulcer are frequently very good, though symptoms are apt to recur. Some attribute the beneficial effects of the operation to the neutralisation of the acid gastric juice by the alkaline contents of the duodenum which flow into the stomach through the stoma, while others, including Moynihan, consider that the mechanical factor, the simple drainage of the stomach, is the chief effect of the operation, the rapid emptying of the stomach affording rest to the ulcer and so facilitating healing. The performance of gastro-enterostomy, however, introduces a third factor to which I believe attention has not hitherto been directed, but which I venture to suggest has an important bearing upon the results of the operation. This factor is the abolition of the sphincter action of the circular muscle fibres divided by the incision from which the stoma is made. If these fibres are those that pass to the ulcer and its immediate neighbourhood, the ulcer is placed at rest, as far as the circular fibres are concerned, though it may still be dragged upon by the longitudinal fibres, which are set close together along the small curvature. Not only are the fibres divided; they are, by the anastomosis, prevented from ever uniting again. An incision that will divide all the fibres passing to an ulcer on the small curvature will clearly have to be considerably longer if it is placed near the great curvature than if it is nearer the ulcer. For an ulcer of moderate size it will have to be of considerable length, and this perhaps may be the explanation of the fact that a large stoma gives better results than a small one, even though the latter is larger than the normal pyloric opening. That drainage of the stomach alone is not sufficient to cause healing was shown by Fibich,[3] who drained by a narrow tube the stomach of dogs in whom chronic ulcers had been artificially produced; the ulcers did not heal, though they healed readily after gastro-enterostomy.

I suggest, therefore, that the operation of gastro-enterostomy, when performed for ulcers of the small curvature, or of the anterior or posterior wall near the small curvature, is, in effect, simply a "gastromyotomy," that the drainage of the stomach and the neutralisation of the gastric juice are not the important factors, and that what the operation really succeeds in doing is to put out of action some at least of the muscle fibres that pass to the ulcer. If there is any truth in this view a much simpler operation should suffice. It is only necessary to divide the muscle fibres and to prevent them from uniting too quickly and the same result will be produced. In the operation that I have described the curved incision, fairly close to the ulcer, divides all the fibres, circular and longitudinal, that pass to the ulcer, and is shorter than an incision at the great curvature would have to be to divide only the same circular fibres.

We have no certain knowledge concerning two points in connexion with the operation of gastromyotomy. First, the length of time required for healing to take place in an ulcer immobilised by section of muscle fibres; secondly, the length of time before the divided fibres unite and function is restored. As regards the first point, Eve reported a case where he has performed gastro-enterostomy for an ulcer in the pyloric part of the stomach associated with considerable inflammatory thickening; laparotomy had to be performed five weeks after the first operation, and it was found that the ulcer had completely disappeared, its site being indicated merely by an omental adhesion. Several somewhat similar cases have been reported. It may, therefore, be taken that, under the most favourable circumstances, complete healing may be a matter only of a few weeks. It may be mentioned that the most favourable conditions are not necessarily secured by keeping the stomach empty and feeding the patient through a tube in the jejunum, for the gastric muscles probably contract, either tonically or rhythmically, even when the stomach is empty; it is doubtful, for example, if an anal fissure could be made to heal by performing colostomy and leaving the sphincter ani intact.

Pyloric Ulcers.

Though it is true, as Sir Berkeley Moynihan points out, that ulcers involving the pylorus have their origin on one side or other of the sphincter and are either gastric or duodenal, nevertheless there is a certain appropriateness in the designation "pyloric" as applied to these ulcers. For, if it is true, as I believe, that it is the invasion of the muscular coat by these ulcers that is responsible for the delay in healing, then the significant thing about an ulcer in this situation is not whether it has originated on one side or the other of the pylorus, but the fact that it has actually invaded the muscular fibres of the pylorus, and is therefore disturbed and irritated by every wave of contraction that passed through these fibres. With the object of setting the ulcer at rest, I have on several occasions in the last few years, in cases of pyloric ulcer, divided the pylorus down to the mucous membrane in addition to performing gastro-enterostomy; the peritoneal coat was united, leaving, as far as possible, the muscle fibres ununited. The cases, however, have been too few to enable one to say whether the step was of any particular value.

During the last six months I have treated four cases of duodenal ulcer involving the pylorus by simple division of the circular fibres without gastro-enterostomy. Though the results have been good and all symptoms have disappeared, I am not entirely convinced by them, and am certainly not prepared, without further experience, to claim that this operation is suitable for all cases of duodenal ulcer. My reasons for hesitating to draw conclusions from these four cases are first, that though the symptoms were definite enough, the ulcers were in each case small, and only indicated by slight scarring on the peritoneal surface without thickening and by slight omental adhesions; secondly, that the muscular coat of the duodenum is so thin and ill-defined that it is difficult to identify it and to separate the peritoneal coat from it, and consequently one is uncertain whether in suturing the latter some of the muscle fibres have not been included. If this should happen, union would presumably take place too soon to allow of a sufficiently long period of rest for the ulcer to heal. Where there is actual stenosis of the pylorus obviously gastro-enterostomy is necessary.

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[3] Langenbeck's Archives, 1906, lxxix.

Musculature of the Stomach.

Radiologists have taught us that the stomach may be divided into two parts—a "cardiac sac" where peristaltic action is sluggish, and a pyloric part where it is very active. The arrangement of the muscular fibres shows that there is an anatomical basis for this division. The circular fibres are only truly circular in the pyloric part of the stomach and to the left of the cardiac portion; in the greater part of the cardiac half they are U-shaped, and so incapable of acting as true sphincters. From the incisura angularis to the pylorus the circular coat is well marked, and strong peristaltic waves pass along it from the time that food enters that part of the stomach from the cardiac sac until the stomach is empty. Furthermore, there is at the incisura a sphincter (physiological only, according to Starling), called by Sir H. M. W. Gray the "sphincter aditus vestibuli,"[4] whose function appears to be to confine the food in the cardiac sac until it is ready to pass into the pyloric pouch. The longitudinal fibres constitute the external coat and are set closer together along the small curvature than elsewhere, while the oblique fibres are distributed chiefly over the fundus and the cardiac sac. Chronic ulcers are found most commonly in the pyloric half of the stomach, and generally nearer the small curvature than the greater, and I suggest that this distribution is due, not to a greater liability to acute ulceration in these parts, but to the fact that the greater activity of the muscles tends to prevent healing of ulcers sufficiently deep to have involved the muscular coat; while the comparative freedom of the cardiac sac (except near the incisura) from chronic ulcer is due to the less vigorous and less prolonged peristaltic action in that part.

Both W. J. Mayo[5] and Sir H. M. W. Gray[4] have pointed out the importance of performing gastro-enterostomy in the pyloric half of the stomach, though for different reasons; Mayo, for the reason that much of the food passes over the stoma if it is placed in the cardiac half, while Gray believes that it is important to conserve the functions of the cardiac sac and drain the pyloric half in order to obviate the ill-effects of pyloric spasm. I suggest that the benefits arising from making the stoma in the pyloric half are due to the fact that the circular fibres passing to the ulcer are divided and kept apart by the anastomosis, the sphincter action of the fibres being thus abolished, and to the fact that drainage of the stomach is not the essential factor, and is, indeed, probably unnecessary. The operation that I have described is an attempt to apply to ulcers of the stomach the great principle of surgery that rest is the most important factor in the healing of wounds. I have performed the operation in nine cases in the last eight months; the number is too small, and the time since operation too short, for the results alone to carry conviction. I mention them to support a view of the pathology of chronic ulcer of the stomach that I believe to be worthy of consideration. Whatever may be the ultimate results of the operation in these cases, it can certainly be said that the immediate results have been satisfactory. In all the cases there had been typical epigastric pain for months or years, all had been treated medically for some considerable time without lasting benefit, and in the gastric cases in each case the ulcer was large enough to admit the tip of the little finger. In one case only has there been any pain since operation; all the patients have been taking ordinary food and have put on weight. In one case of ulcer of the anterior wall, though pain and vomiting had ceased, some loss of weight was observed four months after operation, and it was discovered that she had diabetes, which was not present at the time of operation. Gastromyotomy is a simple and safe operation, and, I believe, only temporarily affects the functional activity of the stomach, but it need hardly be said it is not applicable to cases where there is stenosis or hour-glass contraction, or anything but a simple ulcer. For an operation so free from risk, from which convalescence is so rapid (as indeed is the case in most gastric operations), and which offers a good prospect of complete recovery, with the preservation of the normal physiology and anatomy of the stomach, I think we may fairly hold the view that even if there should turn out to be a small proportion of recurrences, the operation is not condemned thereby. More radical measures are still available if the ulcer should recur.

Gastromyotomy is the link between medical and surgical treatment; the aim of medical treatment is to encourage healing by diminishing functional activity and so resting the stomach; the operation secures rest by putting out of action for a time the actual muscle fibres whose contractions irritate the ulcer. All that I could claim for this operation, and more, might be expressed by saying that if at the time when the "Lectures on Rest and Pain" were written gastric ulcer had been a surgical condition, such a view of its pathology as I have tried to bring forward, and perhaps such an operation as the above, would have appealed to John Hilton.

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[4] THE LANCET, 1908, ii., 551.

[5] Collected Papers of Mayo Clinic, 1914.

ALKALI DEFICIT* IN NEPHRITIS.

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ON ordinary diet, as a result of oxidation of neutral sulphur and phosphorus in the food to form sulphuric and phosphoric acids, and of the formation of organic acids, an excess of non-volatile acids arises daily, equivalent to about 500 c.cm. of N/10 solution, which should be excreted by the kidneys. When the kidneys are inadequate for this task retention of acid occurs, just as retention of urea occurs when the kidneys are unable to excrete urea as fast as it is formed. Because as a general rule, on ordinary diet, the kidneys are presented with an excess of acid to excrete, alkali deficit is more common than alkali excess in untreated cases of nephritis.

Methods for Detection of Alkali Deficit.

Many methods have been used for detecting the presence of alkali deficit; of these the most satisfactory is the estimation of the bicarbonate content of the plasma, preferably together with the hydrogen-ion concentration of the plasma. This gives direct information as to the actual balance of acids and bases in the blood, and indirectly in the other body fluids also. When the respiratory centre, heart, and lungs are carrying out correctly the regulation of blood reaction by control of CO_2 excretion, the CO_2 tension of alveolar air gives the same information, but in nephritis this regulating mechanism may be profoundly disturbed by interference with the blood-supply of the respiratory centre, heart failure, and œdema of the lungs, and the alveolar air becomes an unsatisfactory index of the condition of the body fluids.

Any method that depends on titrating the serum or plasma to an end-point distant from that of plasma, as, for example, to the yellow-red changing point of methyl orange, the agglutinating point of red blood corpuscles, or the iso-electric point of serum globulin, are fallacious, as they involve titration of the proteins of the plasma or serum. The factor thus introduced is variable, as the protein content of the plasma varies, especially in nephritis. When the kidneys are damaged it is obviously impossible to use them as indicators of the state of the blood and other body fluids, as they may excrete an alkaline urine when the blood contains an excess of acid, or vice versa. For this reason the method of alkali tolerance—the determination of the amount of sodium bicarbonate, given by the mouth, required to make the urine alkaline—though very unsatisfactory when the kidneys are healthy, is entirely fallacious in nephritis; in this condition it is no more justifiable than would be an attempt to titrate an acid with a faulty indicator.

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* Owing to the confusion that has arisen as to its meaning, the familiar term "acidosis" has not been used for the condition in which an absolute or relative excess of non-volatile acid in proportion to alkali is present in the blood; Van Slyke's term "alkali deficit" is used instead. The term "acidæmia," recommended by the Medical Research Committee, is not suitable, as it is defined as an increase in the hydrogen-ion concentration of the blood, which may or may not accompany alkali deficit.

The results of plasma bicarbonate determinations are usually expressed as the number of c.cm. of CO_2 that the bicarbonate in 100 c.cm. of plasma would give off on treatment with excess of acid, although this method of expression is undesirable, as in order to determine the effect of the retention of a given amount of acid on the plasma bicarbonate it is convenient to have both expressed as gramme equivalents per litre. The normal figures for plasma bicarbonate expressed in the customary manner range between 55 and 70. Cases of alkali deficit may conveniently be classified into mild with plasma bicarbonate between 45 and 54, moderate between 35 and 44, and severe under 35. In the more severe cases the increased lung ventilation fails to keep down the dissolved CO_2 in the plasma in proportion to the reduced plasma bicarbonate, with the result that the hydrogen-ion concentration of the plasma rises; this, however, does not occur in the less severe cases.

In the more severe cases of alkali deficit, in interstitial nephritis at any rate, some one-sixth to one-half of the reduction of plasma bicarbonate is accounted for by retained phosphoric acid; other acids, sulphuric among them, account for the remainder. The condition does not develop rapidly. Thus a patient who had had an extreme degree of alkali deficit and renal incompetence was given sodium bicarbonate, and her plasma bicarbonate brought back to normal; after the alkali administration had been stopped her plasma bicarbonate fell from 51 to 41 in a week; the patient was taking little carbohydrate, so that the acid production from the oxidation of protein must have been large.

Incidence of Alkali Deficit in a Series of Cases.

The incidence of mild, moderate, and severe alkali deficit in 216 examinations of patients who had not been treated with alkalis, arranged according to the height of the blood-urea, are shown in the table.

Showing Incidence of Alkali Deficit in a Series of Cases Arranged According to the Height of their Blood-urea.

—		Blood-urea in mg. per 100 c.cm.		
		Under 50.	50–100.	Over 100.
Total number of estimations		102	60	54
Alkali deficit	Mild	3	9	12
	Moderate ..	1	3	9
	Severe	0	1	13
	Of all degrees ..	4	13	34

In the one instance of a moderate alkali deficit with a normal blood-urea the patient had been having fits with clonic contractions for some hours, and the alkali deficit was probably, in part at least, due to accumulation of lactic acid. The three patients with mild alkali deficit in this group were all recovering from acute nephritis.

It appears from this table that alkali deficit is rare in patients with fairly efficient kidneys, and frequently, but not invariably, present in patients with severe kidney inefficiency. The higher incidence found by other methods is due to faults mentioned above. The severity of the condition is further shown by the death-rate; of seven patients with moderate alkali deficit four died within two weeks; of 14 with severe alkali deficit five died within a few days and five more within a month.

Associated Conditions.

As may be expected, alkali deficit and uræmia are frequently associated, but the alkali deficit itself seems to play no part in causing any of the symptoms of uræmia. Uræmia often occurs in patients with normal plasma bicarbonate, and is absent in others with severe alkali deficit; while patients in whom the plasma bicarbonate has been brought back to normal from a very low figure and maintained about normal may, after the lapse of some days or weeks, develop uræmia. Dyspnœa is very rare with alkali deficit in nephritis; hyperpnœa may be present, but is usually not striking. Actual dyspnœa and Cheyne-Stokes breathing occur rather in patients with arterial degeneration or some degree of heart failure, and are due to disturbance of the blood-supply of the respiratory centre. Headache and vomiting are no more common in patients with alkali deficit than in those without; in fact, the striking feature is the small effect that even an alkali deficit with increased hydrogen-ion concentration has—which fact supports the now generally accepted theory that the symptoms observed in diabetic ketosis are due not to the alkali deficit per se, but to the nature of the acids retained, and enforces the undesirability of confusing the terms "acidosis" and "ketosis."

Treatment.

Unlike other disturbances in severe nephritis alkali deficit is amenable to treatment, and treatment of the more severe degrees is certainly advisable, as the body will not stand more than a certain increase in the hydrogen-ion concentration of the body fluids, and as the bicarbonate falls the change in hydrogen-ion concentration produced by a given increase of retained acid steadily rises. On the other hand, the urgency of the need of alkali is not so great as to demand such emergency methods as intravenous injection, as there is not the rapid production of acid such as may take place in ketosis, and enough alkali can be given by the mouth to neutralise any fresh acid that may be formed and leave an excess for increasing the plasma bicarbonate. Rectal administration should not be employed, as it is impossible to form an accurate estimate of the amount absorbed.

The oral administration of sodium bicarbonate by the mouth has its dangers. Nephritics are unable to get rid of an excess of alkali as well as an excess of acid, and if excess is given a condition of alkali excess is produced, a condition more dangerous than alkali deficit, although it tends to cure itself if alkali administration is stopped. For this reason the amount of bicarbonate given should not be more than required to bring the plasma bicarbonate back to normal. Also the administration of large doses of sodium bicarbonate alone is liable to upset the balance between sodium, potassium, and calcium in the body fluids; for this reason potassium and calcium should be given at the same time. Calcium administration is all the more necessary as plasma calcium is often low in nephritis with alkali deficit. Again, administration of large doses of sodium bicarbonate often leads to increased retention of water, and increases œdema and the danger of œdema of the lungs; this provides further reason for keeping the amount given as low as possible. It is therefore desirable to give about as much sodium bicarbonate as will bring the patient's plasma bicarbonate up to 40; this removes the danger of the development of a fatal hydrogen-ion concentration. The amount required to do this can be calculated from the formula $g = W (40 - x) / 2$, where x is the patient's plasma bicarbonate before administration, W his weight in kg., and g the number of grains of sodium bicarbonate required. With this should be given $\frac{g}{20}$ gr. potassium bicarbonate, and calcium lactate. Having brought the plasma bicarbonate up to this level, the production of acid should be kept as low as possible by feeding the patient on a mainly carbohydrate diet to reduce the production of acids from food protein or from the patient's own tissues to a minimum, and moderate doses of sodium bicarbonate—e.g., 20 gr. three times a day—should be given. Such treatment will not prevent the patient from dying from other causes; it may not prolong life, but it removes the risk of death from uncompensated alkali deficit.

Illustrative Cases.

The following cases illustrate points considered in this paper:—

CASE 1.—Severe alkali deficit; death probably accelerated by administration of large doses of sodium bicarbonate.

Female, aged 17, subacute parenchymatous nephritis. Œdema of arms and legs began in June, 1922. On Jan. 26th, 1923, general œdema; systolic blood pressure, 170 mm.; no cardiovascular hypertrophy. Urine scanty, albumin ¼ volume, granular casts. Red blood corpuscles, 1·4 million per c.mm.; Hb, 35 per cent. On the 27th plasma bicarbonate, 21; pH, 7·3; blood-urea, 320 mgm. per 100 c.cm. Mind clear; no hyperpnœa. On the 29th 1 dr. sodium bicarbonate, with proportionate amounts of potassium bicarbonate and calcium lactate, given every three hours. Gained 29 oz. in weight during next 24 hours, although she had, since admission, been losing weight. Died on evening of the 30th.

Post-mortem Examination.—Subacute lipoid parenchymatous nephritis; slight cardiovascular hypertrophy; very great œdema, and considerable congestion of lungs; general œdema.

Case 2.—Severe alkali deficit; onset of uræmia after the acidosis had been somewhat reduced. Female, aged 17, out of sorts for seven months. July 18th, 1922, very slight œdema; blood pressure 162 mm. systolic, 80 mm. diastolic; bleeding from gums. On the 20th mind quite clear; slight dyspnœa on speaking much. Red blood corpuscles, 2·5 million per c.mm.; Hb, 35 per cent. Urine: albumin ⅓ volume; deposit pus. Plasma bicarbonate, 16; pH, 7·2; blood-urea, 320 mg. per 100 c.cm. On the 21st 500 c.cm. 2 per cent. sodium bicarbonate given intravenously; and ½ dr. by mouth every four hours. On the 22nd plasma bicarbonate, 28; pH, 7·4; blood-urea, 320 mgm. per 100 c.cm. General convulsions and coma, with intervals of consciousness, set in at 2 P.M.; later coma became continuous and death ensued on the morning of the 23rd.

Case 3.—Very severe alkali deficit; uræmia and death after plasma bicarbonate had been maintained at a level little below normal for some weeks. Female, aged 25. Chronic interstitial nephritis. Breathless and giddy during last three or four years. Swelling under eyes since August, 1922, vomiting since September. Urine: Albumin, 1/10 volume, small amount of pus, daily output about 1200 c.cm. Very severe anæmia. Nov. 16th, 1922, drowsy, no hyperpnœa nor dyspnœa. Plasma bicarbonate, 13; pH, 7·2; blood-urea, 343 mg. per 100 c.cm. At midnight she was given 350 c.cm. 2 per cent. sodium bicarbonate intravenously, followed by a drachm of sodium bicarbonate by the mouth every three hours; on the 17th and 18th 1 dr. given every two hours with 3 gr. potassium bicarbonate, and 10 gr. calcium lactate. These salts were given every four hours on the 19th and discontinued on the 20th. On second two days of administration the output of urine was about 2 litres less than the intake of fluid. On the 20th plasma bicarbonate, 74; pH, 7·55; blood-urea, 400 mg. per 100 c.cm. On the 22nd muscular twitching, headache, and vomiting. On the 23rd plasma bicarbonate, 51; pH, 7·45; blood-urea, 505 mg. per 100 c.cm. On the 30th plasma bicarbonate, 41; pH, 7·35; blood-urea, 600 mg. per 100 c.cm. On Dec. 4th bicarbonate mixture given again with calcium lactate every four hours until death. On the 7th plasma bicarbonate, 48; pH, 7·35; blood-urea, 480 mg. per 100 c.cm. Patient died on the 8th after one fit.

Post-mortem Examination.—Very great destruction of kidney substance by chronic interstitial and little acute parenchymatous nephritis. Very great œdema of lungs, general œdema, ascites (1 pint), bilateral pleural effusion (½ pint each side).

Case 4.—Severe alkali deficit with little disturbance. Female, aged 31, congenital cystic kidneys. History of polyuria and frequency since infancy. No cardiovascular hypertrophy; blood pressure, systolic, 135 to 145 mm.; diastolic, 85 to 90 mm. Able to do a moderate amount of work. Urine: Low specific gravity, containing a small amount of albumin and pus. From July, 1921, to March, 1922, phenolsulphonephthalein excretion in two hours from traces to 13 per cent.; urea-concentration test, 0·8 to 1·35 per cent.; blood-urea, 90 to 114 mg. per 100 c.cm.; plasma bicarbonate, 52 to 55. On Oct. 26th, 1922, still feeling well and able to work; no noticeable hyperpnœa. Plasma bicarbonate, 33; pH, 7·2; blood-urea, 141 mg. per 100 c.cm.

Case 5.—Uræmia without alkali deficit. Male, aged 51. History of six months' illness with failing sight, weakness, and shortness of breath; later vomiting. On July 30th, 1921, two fits in the night; on the 31st unconscious with muscular twitching. Systolic blood pressure, 140 mm.; no cardiovascular hypertrophy. Urine only 46 oz. in three days; specific gravity, 1000; trace of albumin, deposit of pus. On the 31st plasma bicarbonate, 60; blood-urea, 152 mg. per 100 c.cm. Patient died on August 2nd.

I owe my thanks to the physicians of the London Hospital for the facilities they have afforded me in the study of their cases.

Reviews and Notices of Books.

Hygiene and Public Health.

Seventh edit. By Louis C. Parkes, M.D., and Prof. H. R. Kenwood. Lewis's Practical Series. London: H. K. Lewis and Co., Ltd. 1923. Pp. 783. 20s.

The new edition of this well-known volume will deservedly hold its own in popularity as a text-book for public health students. The authors have endeavoured to embody recent advances in public health and sanitary science without increasing the size of the book—no easy task, when we consider how the scope of public health work has been widened by the inclusion of schemes for dealing with tuberculosis, maternity and child welfare, medical inspection of schools, venereal diseases, &c., and also how views and methods have changed with regard to water purification, sewage disposal, nutrition, and ventilation. The greater interest awakened in physical development, light treatment, smoke prevention, industrial hygiene, and tropical diseases also demands some satisfaction from a text-book. The authors have wisely decided to omit the chapter on sanitary law, references being, of course, made throughout the text to the laws and regulations on the subjects treated. Examining bodies are rather too fond of setting questions of a legal nature to candidates for sanitary certificates and diplomas. It is too often forgotten that town clerks and legal luminaries do not trust to their memory of sections of Acts of Parliament when taking proceedings.

When the time comes for the next edition, we think the authors will be well advised to lighten the ship still further by omitting or shortening the references to more or less obsolete appliances and matters of purely historic interest. For example, in these days, when the cult of the open window is being practised or preached for the ordinary dwelling-house, and in view of the recognised uncertainty as to whether in the absence of mechanical power the air in a so-called ventilation duct will move according to plan, there is little necessity to devote space to such things as Tobin's tubes, Ellison's conical bricks, and Montgolfier's formula. On the other hand, more space might usefully be devoted to smoke prevention. Similarly under the heading Biological Purification of Sewage, while there is an interesting history of methods adopted since 1891, the authors have not found space for any account of the Sheffield system which formed the subject of a leading article in our issue of May 27th, 1922. The "activated sludge" system is shortly described by the authors, but Mr. John Haworth, of Sheffield, found that by a simple process of churning with paddles he could get satisfactory aeration without using compressed air machinery. This process has passed the experimental stage and will be gradually applied to a dry weather flow of 15 million gallons in Sheffield. It is also in use in Paris, Glasgow, East Ham, and Rotherham, and schemes are in course of construction in other towns. There are, of course, many things in this many-sided book which invite criticism, according to the views of the critic. We do not think Sir Henry Gauvain would endorse the views of the authors (p. 289) on the clothing of children, and we are not sure that, apart from footgear, women do not dress as hygienically as men nowadays. A text-book on public health cannot deal exhaustively with all the diseases which come under review, but surely the risk of the oncome of rickets (pp. 313 and 314) should be placed earlier, to be in accord with modern views.

A chapter of 200 pages is devoted to communicable diseases and a good account is given of each with the methods suitable for prevention. We missed, however, that modern plague of Egypt—bilharziasis. We note one or two errors in the indexing—e.g., vitamin 399 for 309, bilharzia 307 for 337, on which pages its life-history appears with that of the other human parasitic worms. Sir William Hamer's theory of the causation of enteric fever in London by fish is treated somewhat vaguely (p. 481). Chapters X., XI., and XII. deal effectively with maternity and child welfare, school hygiene, and industrial hygiene respectively.

We can heartily recommend the new edition of this book as an admirable introduction to the study and practice of public health.

COLLOIDS.

Théorie colloïdale de la biologie et de la pathologie. By AUGUST LUMIERE, Correspondant national de l'Académie de Médecine, Paris. Éditeur: Etienne Chiron. 1922. Pp. 202. Fr.16.

THERE are many volumes on the subject of colloids in circulation at the present time. The majority are much alike, taking as they do the perplexed reader through various colloidal properties such as Brownian movement, adsorption, electrical potential, and the like. In addition to all this, he is harassed with pages of complex mathematical calculations, with the result that usually his state of knowledge when he finishes the book is the same as when he started. Fortunately there have been some exceptions to this series of books, among which the volume at present under consideration has a certain amount of claim to be placed. It is not difficult to follow and is attractive in many ways, but its scientific value is unfortunately doubtful. The book is divided into two sections, the first dealing with a summary of colloidal properties in general and the application of colloidal principles to physiology, and the second with the part played by colloids in pathology. The first 20 pages are devoted to a description of colloids from a purely scientific standpoint. This section is very sketchy, only the barest outlines being given. Using this as a foundation, the author employs the remainder of the book to build a superstructure of speculation. A colloidal interpretation of the origin of life, evolution, and death is given. In the second part colloids are shown to play an important part in anaphylaxis, immunity, and cancer.

Though the book is devoted almost entirely to speculation, the arguments are presented with remarkable clearness and make good reading.

PRACTICAL BACTERIOLOGY.

Blood Work and Animal Parasitology. Seventh edition. By E. R. STITT, A.B., Ph.G., Sc.D., LL.D., Rear-Admiral, Medical Corps, and Surgeon-General, U.S. Navy. London: H. K. Lewis and Co., Ltd. 1923. Pp. 766. 21s.

IF called upon to go to some remote spot, being permitted the privilege of taking with them only one work of reference, the odds are good that of the great mass of practical laboratory manuals nine out of ten clinical pathologists would choose "Stitt." The present is the seventh edition of this invaluable work; it has been enlarged and brought thoroughly up to date, and several new sections and many new illustrations have been added. The book, although now comprising 766 pages, remains of compact form and of a size and shape which will enable it to slip readily into any ordinary coat pocket; this portability remains one of the most engaging features of this work: every available inch of paper is taken up, even to the insides of the covers, in pleasing contrast to the wide margins and liberal spacing which render the modern American manual a most unwieldy means for the dissemination of knowledge.

The descriptions of technique in all sections are concise but none the less quite full enough for guidance, and include in all departments not only old and tried methods but also most of the recent ones of any value. For example, in the section on media-making the useful method described not long ago by McIntosh and Smart for the preparation of routine media finds place. The failure to include a description of the Dreyer Sigma reaction in the section on flocculation tests for syphilis is an omission which should be rectified in the next edition. In the section on blood grouping the classification of Jansky as opposed to that of Moss has been adopted: this change is made in conformance with the decision of authoritative scientific bodies in the States; but though the author has taken trouble to make the matter clear, it holds the seeds of confusion for workers in this country. Note is taken of the work of Guthrie and Huck, published only last spring, on the possible existence of a further "agglutinogen" C; this work is so recent and untested that it was perhaps hardly wise to include it. In the section on the cells of the blood, that test-point for hæmatologists, the differentiation of large "hyaline" or "mononuclear" cells from large lymphocytes is competently dealt with; the work of McJunkin on phagocytosis by large mononuclears and their possible or probable endothelial origin might have been mentioned. Very valuable are the sections on helminthology and medical entomology, and this remains almost the only work of its sort in which poisonous reptiles and fish are noticed. The only real criticism that can be made of the book is the absence, no doubt deliberate, of references.

Practical Bacteriology for Chemical Students. By DAVID ELLIS, Ph.D., D.Sc., F.R.S.E., Head of the Department of Bacteriology and Botany in the Royal Technical College, Glasgow. London: Longmans, Green and Co. 1923. Pp. 136. 4s. 6d.

THIS little book contains a detailed account of the elements of bacteriological technique, arranged as a series of practical exercises. It is the endeavour of the writer to give the chemical student (and we gather his attention is directed more particularly towards the industrial chemist) a sufficient competence of bacteriological knowledge to enable him to investigate processes involving microbial growth when he finds it necessary to do so. Rather inevitably we tend to judge the book by the standard of medical bacteriology, and in doing so we cannot feel that it is quite adequate, or that the author's attempt will be successful. Over six pages are devoted to the staining of spores and cilia, processes which are seldom called for and of little practical use. Gram's stain is described with the omission of the counterstain. The student is told to make up sterile solutions of sugars, and to keep these in drop bottles for adding to his broth when the occasion arises! These we consider evil practices. There is also a frequent repetition of calculations of a most simple nature, such as the finding of the mean of eight whole numbers which occupies a half of page 82, and the titration of the acidity of fluid, on page 60; these are quite unnecessary and already known to any form of chemical student. Prof. Ellis's diction is at times a little unnerving. He constantly speaks of "diagnosing" bacteria, when he means identifying them, and he directs us, when we are about to stain our slide, to "clutch it with a pair of pincers." We note that Figs. 36 and 37 are absent, although reference to them appears in the letterpress. Probably the book will be useful in the special field for which it is designed; it is not suitable for medical students.

CHIRURGIE VASCULAIRE CONSERVATRICE.

Par P. MOURE, Chirurgien des Hôpitaux de Paris. Paris: Masson et Cie. 1923. Pp. 179. Fr.12.

THIS volume provides in a compact form a comprehensive account of the surgery of the blood-vessels. The first part of the book deals with the more general questions of operative technique, difficulties, complications, and results. The second part gives an account of the surgery of recent injuries to blood-vessels, of aneurysms, of embolism and thrombosis of arteries, and of vascular anastomoses and grafts. It is useful to possess in so accessible a form clear accounts of operations which are but seldom carried out by most surgeons. The text is aided by a great many reproductions of semi-diagrammatic drawings. These drawings are, indeed, so clear that many of the operations appear to be much simpler than they actually are in practice; but apart from this the book may be taken as a reliable guide to the subject with which it deals. The text contains a large number of references to other authorities.

POST MORTEM; ESSAYS HISTORICAL AND MEDICAL.

By C. MacLaurin, M.B., C.M., F.R.C.S.E., LL.D., Lecturer in Clinical Surgery, University of Sydney. London: Jonathan Cape. 1923. Pp. 255. 7*s.* 6*d.*

It was with great relief that we opened this book to find that it was not a farrago of eschatology such as not so long ago used to appear in a weekly journal, for from the simple title we had feared that such might be the case. Instead, we found a series of more or less historical essays dealing mainly with the question as to how their conditions of health affected for good or ill various people notable in the history of the world. Somehow, to know that the Empress Theodora suffered from cancer or to consider that Jeanne D'Arc was an instance of infantilism and sex repression makes them more real to some people than if they are looked at solely from the point of history. Dr. MacLaurin writes in a breezy, but attention-compelling fashion. Here and there he falls into strange errors, as, for instance, on p. 69, where he makes Nestorius the author of the Monophysite heresy, when it was actually Eutyches, who fell into the heresy owing to his violent opposition to Nestorius. In his essay on Theodora he recalls the well-known and oft-repeated fact that violent sexuality is in some way related to powerful religious instincts, and in another passage that her career as Empress is "the most extraordinary instance on record of living a thing down." There was a comparable instance in our own times in the case of Laura Bell, whose marriage in 1852 to Mr. Thistlethwayte, after a notorious career, excited so much interest in society in the fifties and after. She took to holding revivalist services and enjoyed the friendship of many eminent people, including Gladstone, until her death in 1894. For details as to her religious services the inquirer should consult Lady St. Helier's Memories of Fifty Years. With regard to Gibbon Dr. MacLaurin asks on p. 187 whether the cause of his death was not acute septic peritonitis from the bursting of the septic hydrocele and hernia through the inguinal ring. It is, of course, possible that this happened, but there is no note of acute abdominal peritonitis in the official account of the post mortem. The contents of the sac were inflamed: "In omento et in intestino colo haud dubia recentis inflammationis signa vidimus." But the surgeon continues that when the abdomen was opened the stomach was found much displaced downwards, the liver was covered with small tubercles, and the gall-bladder distended. "In caeteris visceribus . . . . nulla morbi vestigia extiterunt." Other of Dr. MacLaurin's papers deal with Anne Boleyn, Charles V., Don John of Austria, and Marat. Altogether lovers of literature will be grateful to Dr. MacLaurin, and we hope to be able to welcome another work from his pen before long, only we advise him to take to heart the advice of Dr. Routh and "verify his references"; Cicero (p. 254) may have said "Video meliora proboque, deteriora sequor," but the remark is generally attributed to Ovid; Metamorph. VII., 20–21.

TRAITÉ D'OPHTALMOLOGIE.

By Dr. A. Poulard. In two volumes, with 710 illustrations and 3 coloured plates. Paris: Masson et Cie. 1923. Pp. 1457. Fr.120.

This work has the merit of being original in the sense that it does not slavishly follow the pattern of previous text-books. Instead of the usual preliminary chapters on the anatomy and physiology of the eye, an adequate knowledge of these things is taken for granted, and the book begins with a chapter on surgical technique with directions for sterilising, &c., and for administering local anæsthesia. After a second short chapter on methods of diagnosis, we are taken through the ordinary routine of ocular diseases in a way not very different from that of other text-books, the descriptions being greatly assisted by excellent illustrations. These are especially welcome in the sections dealing with operations. Dealing with wounds of the eyeball, the author deprecates the excessive dread of sympathetic ophthalmia, a dread which in his view is responsible for many unnecessary mutilations. He is opposed to the total enucleation of a wounded eye except in very special circumstances, and would in most cases substitute a partial evacuation with retention of the outer envelope or even of the whole posterior portion of the globe. So long as the ciliary body is removed there can, he says, be no danger. The probability is that in this he is right. Yet in view of the tragic consequences which have sometimes followed a too conservative procedure, most surgeons will still choose to be on the safe side, even at the sacrifice of some cosmetic advantage. The description of the major operations proceeds along accustomed lines, but operations on the lids are described and illustrated in greater detail than is usual. We must demur to the advocacy of probing with large probes for lacrymal obstruction. This treatment was formerly common in this country but has been very generally given up on account of the frequency with which false passages were made and the formation of secondary scar tissue caused. According to Poulard, excision of the sac is an operation only rarely required in cases where probing has proved ineffectual. We look in vain for a recognition of the danger of infection to the cornea in operation cases or of the fact that a common cause of hypopyon ulcer is regurgitation from a chronically inflamed sac. There are certain other omissions. The author justly criticises the use of the phrase "rheumatic iritis" for cases of iritis where the cause cannot be determined, but he fails to point out the different septic conditions which have been shown to have a causal relation to many of these cases. Again, in treating of ocular paralysis he justly remarks that cases attributed to cold are generally those in which the real cause is unknown, but he does not afford much help in arriving at a more exact diagnosis. Multiple sclerosis is only just mentioned as a possible cause.

The work is well written, well printed, and well illustrated, but it is not a text-book likely to supplant those already popular with English-speaking students.

MONTAIGNE AND MEDICINE.

By James Spottiswoode Taylor, M.D. Lond., Commander, Medical Corps, U.S. Navy. Oxford University Press: Humphrey Milford. Pp. 244. 14*s.*

This book is a reprint of a series of papers which we have noticed from time to time, as they appeared in "Annals of Medical History," Vol. III., Nos. 2, 3, and 4, published in November, 1922. In book form many additional illustrations have been supplied. Montaigne is one of those discursive and personal writers to whose works, as to those of Sir Thomas Browne, Feltham of the "Resolves," Burton, and Montagu, who wrote "Manchester al Mondo," we return again and again, and Commander Taylor here puts before his readers in a handy form Montaigne's comments on contemporary medicine and physicians, his thoughts on matters of life and death, an account of his ailments (he suffered much from urinary calculi), and his travels in search of health, all these excerpts being interspersed with shrewd comments of his own. We think that Commander Taylor has rather strained the likeness between Montaigne and physicians; when we read his comparisons we cannot help remembering that "there is a river in Macedon, and there is also moreover a river at Monmouth . . . . and there is salmons in both." We draw attention to this with the less reserve in that Commander Taylor himself seems to doubt what he calls "perhaps superficial parallelisms and analogies." However, he has produced a most interesting book for which we are grateful. We may note modern parallel to Montaigne's account of the Flagellants whom he saw in Rome. On p. 174 Commander Taylor quotes from his account of how the penitents scourged themselves with ropes until their backs were raw and bloody, and he was struck with their apparent indifference to pain. The same scene may be witnessed in Persia to-day at the Moharram festival where the devotees scourge themselves with heavy chains until the back and shoulders are a mass of bloody bruises, while others slice their heads with swords until the blood streams down over the long white shirts which they wear.

ENCYCLOPÉDIE FRANÇAISE D'UROLOGIE.

Edited by DR. A. POUSSON, Professeur à la Faculté de Médecine de Bordeaux, and DR. E. DESNOS, Secrétaire Général de la Société International d'Urologie. Paris: Octave Doin. 1922. Vols. V., pp. 1110, and VI., pp. 1086. Each vol. Fr.60. Vols. I.–VI. complete Fr.300.

THESE two compendious volumes form parts of an important work on urology by various French authors. The scheme of the work is encyclopædic. The literature of each subject is collated, and a very extensive classified bibliography is added at the end of each chapter. The views and methods of many authorities are concisely given without interfering unduly with the thread of the narrative. Vol. V. is entirely devoted to diseases of the urethra. Among many important articles may be noted examination of the urethra and urethroscopy by Noguès and Papin, some excellent coloured illustrations being included in this article. Stricture of the urethra and its complications is described in 215 pages by Escat, and further space is devoted to the technique of operations on the urethra by Noguès, Heitz Boyer, and Genouville. Vol. VI. deals entirely with diseases of the prostate and urinary symptoms in general. There are chapters on the examination and injuries of the prostate (André), inflammation, calculi and cysts (Oraison), hypertrophy (Marion), malignant tumours (Pauchet), tuberculosis (Erzbishoff). The extent and thoroughness of the work may be gauged by the fact that the article on hypertrophy of the prostate by Marion extends to 187 closely printed pages, with an additional 16 pages for the bibliography. In this section the author gives an account of the present knowledge of simple enlargement of the prostate and its treatment. In another section he describes the operative technique he personally adopts. The section on urinary symptoms includes such mechanical conditions as retention and incontinence of urine (Delbet), and abnormal conditions of the urinary secretion and composition, such as anuria, phosphaturia, oxaluria, glycosuria, &c.

It is impossible to discuss the various subjects in detail, but it may be said that the thoroughness with which the literature is collated and the high standard of the discussion are maintained throughout. These volumes form, with the others which have already appeared, one of the most extensive and authoritative publications on urology at the present time. They should be included in the reference library of every urinary surgeon and may be recommended to the notice of physicians studying the medical aspects of urinary disease.

POISONOUS PLANTS OF ALL COUNTRIES.

Second edition. By A. BERNHARD-SMITH, L.M.M.S.A. London: Baillière, Tindall and Cox. 1923. Pp. 112. 6s.

THIS book consists of a list of the known poisonous plants. Of each plant, the nationality, popular synonyms, the natural order, the chief characteristics and season of flowering, and the toxic principles are given. Then follow a few lines from one of the poets—some apt, some of doubtful suitability. A small illustration is given of nearly all the 150 plants named.

The value of the book is as one of reference, an intermediary between a work on botany and one on toxicology. It would be more compact and would bear a more business-like air if the quotations were omitted. Some lines on the relative toxicity of the plants would please its readers more than lines of poetry. The appendix with lists of "plants reputed poisonous" is especially tantalising, as one gets no clue as to whether the reputation is true or false. The illustrations, uncoloured and small, are quite good for their size, but are not sufficiently detailed to help much in the recognition of the plants. Some of the active principles given do not correspond in title to those accepted by pharmacologists—scillipiain is given for squill, rheonilic acid for rhubarb; laburnum and its poison are given as cystisus, and cystisine instead of cytisus and cytisine. The plants are divided into classes according to the action of their poisonous constituent—namely, those acting on brain, spinal cord, and heart, irritant poisons, and specific irritants. These last include micro-fungi and bacteria. As, however, symptoms are not given, this division does not carry much value. The book may be useful in putting the reader on the track of any poisonous plant he wishes to study, but he will not find much of value about the plants in its pages.

DIFFERENTIAL DIAGNOSIS OF INTERNAL DISEASES.

By M. HOWARD FUSSELL, M.D., Professor of Applied Therapeutics at the University of Pennsylvania; Physician to the Hospital of the University of Pennsylvania. London and New York: D. Appleton and Co. 1923. Pp. 880. 35s.

THIS is a reprint of a popular volume by the late Prof. Fussell. It follows the classification of diseases used in Osler's Text-book, and deals at length with the differential diagnosis in each case. Certain omissions, such as the similarity of gastric syphilis and carcinoma of the stomach, and the importance of cardiac and renal diseases in the differential diagnosis of ascites, call for correction, but the volume as a whole is a well-arranged and useful one. As a work of reference for the general practitioner it should be welcome.

ACCIDENTS DU TRAVAIL.

Guide pour l'évaluation des incapacités. Second edition. Par LÉON IMBERT, C. ODDO, P. CHAVERNAC. Paris: Masson et Cie. 1923. Pp. 936. Fr.40.

THIS book is primarily written for those who have medico-legal responsibilities connected with the French law of 1898 et seq., to facilitate the consideration of problems arising in connexion with industrial accidents and occupational diseases. The authors have written lucidly in their several sections; for medical men information is given as to the bases of legislation and jurisprudence in relation to the results and sequelæ of accidents. For the legal profession essential medical information is provided and expressed in language free, so far as is possible, of technical medical terms.

This second edition is entirely re-written and, in fact, constitutes almost a new work. New and unlooked for problems have arisen, many of them consequent on the recent war. The ground covered is extensive. Industrial sickness and its development; traumatism in relation to the incidence (post-traumatic) of tuberculosis, cancer, and general disease; the traumatic chronic arthopathies; the chronic œdemas, thrombophlebitis of the limbs; regional injuries, including the eye, ear, and central nervous system; traumatism in relation to the genito-urinary system (male and female); psychoneuroses in relation to industrial accidents are among the subjects dealt with. The views of the authors may not be accepted in every detail, but they have ventilated in a provocative and able manner problems that are of considerable and sometimes pressing importance.

An appreciable number of ex-Service men in our own country have developed pulmonary tuberculosis after their disabilities of gunshot wounds or traumatic injuries of the chest or chest wall. The lapse of time in some cases between the original injury and the overt symptoms or signs of tuberculosis may cover several years, and it is then difficult to link up the new infection as having relation to the original disability. The authors state that it is recognised that traumatism may, in certain cases, be the means of inoculating or localising tubercle; of aggravating or revealing existing or latent tuberculosis. In rare cases an accident may cause a generalisation of pre-existing tubercle. War experience has, in their opinion, to a large extent, confirmed the fact that severe and extensive injuries are not found to be followed by tuberculosis nearly so frequently as when the injuries have provoked less severe reactions. Sergent, Challamel, Léon Bernard are quoted, and the consensus of opinion suggests that penetrating wounds of the chest, producing comparatively little immediate effects, may several years later be the starting-point of pulmonary tubercle. As to traumatic nephritis, traumatism is stated to produce in a previously healthy kidney lesions which in their chronic character and by their extension to the other kidney are clinically akin to Bright's disease and may be confounded with it. The difficulties and problems raised in accepting this condition as a new disease entity are appreciated and discussed. The volume, though somewhat bulky, is worthy of careful perusal.

HODGKIN'S DISEASE.

By R. A. BENNETT, M.D. Lond., M.R.C.P. Bristol: John Wright and Sons. 1923. Pp. 56. 2*s.*

IN this pamphlet the author gives an excellent straightforward account of Hodgkin's disease based on his own experience of 15 cases and covering much the same ground as the articles on the subject in the larger systems of medicine. The author has no particular fresh view to bring forward, but in an open-minded discussion of the causation of the disease he inclines to the view that it is due to tubercle bacilli which have been altered by the lipolytic ferment of lymphocytes operating in individuals of a peculiar disposition. As an empirical trick for controlling the bouts of fever, he commends the inunction of creosote (½ drachm) in the axilla or groin.

BOOKS FOR NURSES.

Pocket Cyclopædia of Nursing. First edition. Edited by R. J. E. SCOTT, M.A., B.C.L., M.D. New York: The Macmillan Company. 1923. Pp. 746. 14*s.*

THIS pocket cyclopædia of nursing comes at a time when the trained nurse and the nurse in training, anticipating examinations by the State, feel a special need for some handy book of reference in addition to the general text-book. The contributors to this excellent cyclopædia include 13 American registered nurses, so that the nurses' needs have been supplied by those who appreciate from practical experience their point of view. All subjects are alphabetically arranged, and the use of a large number of cross references takes the place of a general index. This cyclopædia should be popular, supplying as it does just the information which is often sought vainly in a dictionary. The information given is by no means superficial, but has been well chosen, and in cases of disease not only is there a lucid explanation given, but a description of the nursing care and treatment follows. Six excellent pages are devoted to diabetes mellitus, and valuable references made to the psychoneuroses. A number of illustrations are included.

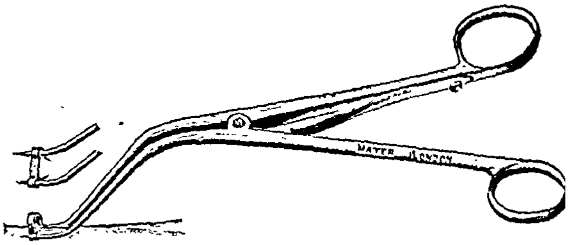
Principles of Home Nursing. By E. L. MOHS, R.N., A.B. London and Philadelphia: W. B. Saunders Company. 1923. Pp. 307. 10*s.*

MISS MOHS has written a book full of useful information, but a book more suitable for the trained nurse or the nurse in training than for the lay mind interested in home nursing. There is an exhaustive chapter on bacteriology with detailed directions as to the use of the microscope for the observation of bacteria and the technique employed in making throat cultures. The "home nurse" in this country would neither be expected to have an extensive knowledge of bacteriology nor would she be called upon to take throat cultures, reduce a dislocated jaw, or to understand the sphygmomanometer. The title of this book is misleading, unless it was intended to imply that it contained information necessary for the trained nurse in the home.

New Inventions.

SUTURE REMOVING FORCEPS.

THE usual methods of removing Michel Clips have great disadvantages. In one the under blade of a special pair of forceps has to be forced up against the actual wound, and in the other, where two hooks are used, the method is clumsy and the hooks are not easy to manipulate. I have therefore had made a pair of forceps angled twice on the flat with two points instead of blades, one point being 1/16 in. longer than the other. These points are separated by closing the handles and are normally held together by a strong spring. The method of use is to insert the longer point into an eye of the clip, and while this point is steadied the shorter one can easily be fitted into the other eye. The handles are then closed and the clip is stretched out flat, being then easily removed. There is no discomfort to the patient and the forceps are very easy to use.

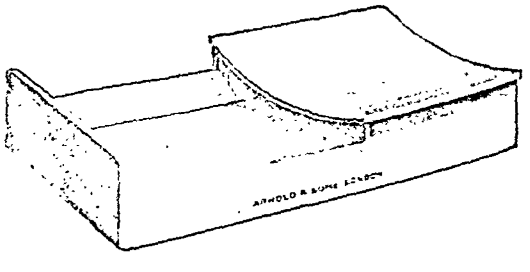


Messrs. Mayer and Phelps, Chiron House, New Cavendish-street, are the manufacturers of the instrument.

Shrewsbury. FRANK H. EDWARDS, M.B., M.R.C.S.

COMBINED IRRIGATION TRAY AND PELVIC REST.

THE combined irrigation tray and pelvic rest, here illustrated, is a convenience to the surgeon as it enables him to use a cystoscope, or any other irrigating bladder or urethral instrument on an ordinary consulting room couch, or theatre operating table. It does away with the necessity for an expensive special table, and overcomes the objections (instability—splashing of couch and towels) which arise from the use of a makeshift, such as a sandbag and separate tray or kidney basin. With the back of the consulting-room couch raised, the tray can be used for urethral irrigation with the patient in a sitting or reclining posture, with the couch flat it gives the necessary pelvic elevation for a cystoscopic examination.



The apparatus, which is strongly made to carry a stout patient, and finished in white enamel, has been made for me by Messrs. Arnold and Sons, of 50/52, Wigmore-street, W.

Sheffield. THOS. B. MOUAT, F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 22, 1923.

THE STATE OF PUBLIC HEALTH.

THE Annual Report[1] of the Chief Medical Officer of the Ministry of Health for 1922 is a voluminous but closely-written document and should be in the hands of every public man and woman, for the right conduct of national health is alike a matter of the gravest and most general concern. The Report commences by giving the statistics illustrating the state of public health in England for the year 1922, and the figures show that, while great gains have been made recently in the health of the nation, and while the death-rate is declining and the expectation of life growing longer, there remain certain places in which the mortality has grown more serious and the position demands inquiry. The number of births registered in 1922 show a decline, while the death-rate is slightly higher than in the previous two years, but nevertheless the expectation of life at birth in this country, as indicated by the figures, is 11 years longer for males and 13 years longer for females than it was 60 years ago. That is the kind of generality which means a great deal when its import is realised. The infantile mortality rate is the lowest yet recorded in the country, although admittedly there is much unnecessary loss of life both for mother and infant in the first month of infancy, while the figures in respect of epidemic infectious diseases give no common message. Measles, pneumonia, and scarlet fever present high notification figures, but diphtheria, enteric, cerebro-spinal fever, encephalitis, and tuberculosis indicate a decline of incidence. Of the two great non-notifiable diseases, venereal disease and cancer, the broad deduction from the facts and figures seems to be that venereal disease has declined and that cancer has substantially increased. The disturbing position with regard to cancer is made the subject of detailed treatment, and those who talk glibly about the supineness of science in the face of a mortal scourge would do well to read closely this section of the Report, if only to ascertain how much work is being done, for how long a period much of it has been carried on, and how valuable is the information which has already been obtained. The Cancer Committee of the Ministry is engaged in a number of inquiries, statistical, nutritional, and epidemiological, and has as one of its principal objects the coördination of investigation in this country and abroad. Happily several organisations have for many years been occupied with this subject, and the accomplishments of the Cancer Department of the Middlesex Hospital, the Imperial Cancer Research Fund, the Cancer Hospital in Fulham-road, and the Radium Institute will be taken into consideration, as well as the work done in various places under the auspices of the Medical Research Council. In May of the present year the British Empire Cancer Campaign was initiated to make a wider appeal for public financial support in the common struggle against cancer, and it would be unreasonable to suppose that nothing more will come of such varied and intensive activities, though in our ignorance of causal agencies no one can prophesy the rate of progress.

A long and interesting section is that dealing with the relation of food to health and disease, in which the questions of the inspection of meat, the sale of food and drugs, the grading of milk, and the general safeguards of our food-supply are gone into. The section is illustrated by a summary of inquiries into cases of food poisoning which occurred during the year, several of the examples given, like that of the outbreak of botulism in Loch Maree, having been fully reported in our own columns. An adequate supply of wholesome food is one of the most important factors in the production and maintenance of national health and efficiency and, as Sir GEORGE NEWMAN points out, this was abundantly proved during the European war, when it was found that the soldier could withstand without detriment to health all manner of hardships and exposures so long as he was regularly provided with sufficient and suitable food. We recommend for serious attention the advice given for the protection of the consumer against food poisoning, for it has not been considered sufficient to supply such general statements as that the premises should be clean, that materials should be of good quality and be properly stored, and that throughout distribution care should be exercised of the finest, and so on. The health and cleanliness of the worker is introduced as a factor of the first importance in the following words: "Whatever is permissible in other industries, the only satisfactory arrangement in respect of food is that it should be prepared by persons entirely free from any communicable or infectious disease, local or general. Such a condition demands (*a*) careful selection and adequate medical supervision of the workers; (*b*) strict cleanliness of person and clothing, which means facilities for washing and suitable clean overalls; and (*c*) the special supervision of healthy workers who have been in contact with cases of disease ('contacts') or carry infection without suffering from disease ('carriers')." It is now the duty of all local authorities to notify the Ministry promptly on the occurrence of food poisoning, and we may say here that that duty is shared by the consumer. Information should be given by the public to the medical officer of health when there is any suspicion that food poisoning has occurred, for only in this way can, on the one hand, abuses be detected promptly, and, on the other, foolish alarms be avoided. Before now the inadvertent creation of food scares has produced an attitude in regard to food poisoning whose influence on the health of the nation as a whole may have been more serious than that of the particular outbreak of poisoning itself.

Throughout the Report there runs the general message which is repeated in so many words in Sir GEORGE NEWMAN'S concluding observations—wise government depends on the assent of the governed. Members of the public are under obligations to cultivate their own health and capacity and so to conduct themselves as not to conduce to the hurt or risk of their neighbours. Preventive medicine is what we have to look for in the future, and its progress must depend in high degree upon the enlightenment of the people.

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[1] On the State of the Public Health. Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1922. London: H.M. Stationery Office. 1923.

CANCER AND DIET.

MOST medical men will have been startled to find in their morning papers last Saturday headlines announcing in more or less flamboyant terms a great discovery in the treatment of cancer by diet, communicated to the meeting of the British Association in Liverpool by Dr. S. MONCKTON COPEMAN. Sensational statements on medical subjects which appear in the daily press do not often demand comment from us, but in this instance weight is given to the statements by Dr. COPEMAN'S standing as a public man and one to whom preventive medicine is substantially in debt. On the basis of the newspaper reports Dr. COPEMAN is apparently of opinion that vitamin A, while of great importance to the young and growing organism, is of comparatively little importance to the adult. Now the effect of rationing during the war years, especially in the Central European States, was essentially a rationing in those foods, such as butter and milk, which in a normal dietary provide the fat-soluble vitamin A, and the disastrous effects of this experiment on a large scale do not bear out Dr. COPEMAN'S contention, which does not seem to be based on any original investigation of his own. In papers[1] [2] published two years ago in our columns the workers from the Lister Institute attributed the hunger-osteomalacia which occurred in Vienna in 1920 to a fat-soluble A deficiency. They also showed that the disease affected chiefly middle-aged and old people of both sexes. Moreover, Dr. COPEMAN seems to have overlooked the literature on the subject. In 1919 Prof. J. C. DRUMMOND[3] undertook an experimental investigation designed especially to test this very point, and he concluded that the adult animal organism requires a regular supply of vitamin A, although the daily requirement is of a smaller order than that necessary to ensure growth in a young animal. Prof. DRUMMOND states that "there is every reason that great care should be taken to ensure that dietaries of adults contain an adequate supply of foodstuffs in which fat-soluble A is present.... In the absence of this factor the resistance to diseases of bacterial origin is seriously impaired." The statement by Dr. COPEMAN that an excess of vitamin A in the diet might eventually become injurious is contrary to all available experimental evidence.

It is difficult to understand the rationale of Dr. COPEMAN'S diet. It is not a vegetarian diet, for he allows ham and bacon. Were his premises correct, then the restriction of vitamin A, which is a factor necessary for the growth of a young animal, should have a retarding effect on the growth of cancer. But the diet actually recommended by Dr. COPEMAN is not a diet free from this factor. He excludes animal fats containing vitamin A such as butter, eggs, and cream, but he adds lettuce and watercress which, as he himself states, contain fat-soluble A. On the basis of his own arguments there is no reason why such a diet should have any effect on the growth of cancer, unless he presumes, as he appears to do, that an amount of vitamin A insufficient to maintain the growth of cancer cells is adequate to maintain the well-being of the patient. But here again experimental evidence has been adduced to show that the growth of cancer cells proceeds quite independently of the presence or absence of vitamin A. Prof. DRUMMOND[4] demonstrated in 1917 that the growth of cancer cells in rats is not inhibited by the complete absence of the fat-soluble vitamin A, and that, in fact, it is not possible to bring about an inhibition of tumour growth by employment of any dietetic restrictions without the nutrition of the host becoming seriously impaired. More recently work in the laboratories of the Imperial Cancer Research Fund has led to exactly the same conclusion.[5] In 1922 we published a paper by Dr. STANLEY WYARD[6] in which he reported on the results obtained in cancer patients by placing them on a diet deficient in vitamin A. This was done at the suggestion of Dr. COPEMAN himself, who was responsible for the composition of the diet. Dr. WYARD'S conclusion was that the results were entirely negative. The diet now adopted by Dr. COPEMAN differs from that which he recommended to Dr. WYARD in containing more vitamin A. It is difficult to gather what claims Dr. COPEMAN now makes for this new diet. It is said to alleviate pain. But the dismal history of cancer remedies shows that this claim is made for every remedy that has failed in other respects. He also claims an increased expectation of life. From the reports published in the press it is impossible to see how Dr. COPEMAN justifies this claim. How many cases has he had under observation? Has he selected his cases or has he chosen his cases indiscriminately? And how does he calculate the expectation of life of a patient afflicted with cancer and not undergoing his treatment?

Dr. COPEMAN may complain that we are criticising his statements on incomplete reports. But it is these reports which have been laid before a lay audience and circulated widely in the press, and their details have not been submitted to the judgment and criticism of his peers. Dr. COPEMAN is a member of the Departmental Cancer Committee, appointed by the Ministry of Health under the chairmanship of Sir GEORGE NEWMAN, which has recently issued an excellent memorandum on the whole cancer problem. The omission from this memorandum of any reference to the effect of diet on the treatment of cancer suggests that Dr. COPEMAN has been unable to convince his colleagues and has now appealed to a wider though less critical audience.

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THE KITCHENER MEMORIAL MEDICAL SCHOOL.

Lord KITCHENER on the occasion of his last visit to the Sudan expressed a strong wish that there should be a medical training school for Sudanese students at Khartoum, and no more suitable memorial for the great soldier could have been chosen than to found such an institution. The proposal appealed to the Sudanese Arabs as well as to KITCHENER'S own countrymen, and as a matter of fact of the £13,000 which had been subscribed by the end of last year, all but £2000 came from the natives of the Sudan, while in addition one Sudan merchant has handed over all his property to trustees in order that on his death the income, which will amount to some £1200 a year, may be devoted to the maintenance of the medical students. There is pressing need for this medical training school in order that young Sudanese doctors may work under Government supervision to bring assistance to the inhabitants of vast districts which are fever-ridden or subject to epidemic and endemic attacks of a dangerous and sometimes decimating character. In addition to malaria, tuberculosis, dysentery, enteric fever, small-pox, and syphilis, there remain to be treated sleeping sickness, kala-azar, bilharziasis, elephantiasis and leprosy, ankylostomiasis and ophthalmia, and the Government of the Sudan is quite unable to deal with the medical and sanitary needs of the immense areas unless a staff of medical men can be established, inured to the climate and familiar with the customs of the people.

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[1] Elsie Dalyell and Harriette Chick: THE LANCET, 1921, ii., 842.

[2] Margaret Hume and Edmund Nirenstein: Ibid., 849.

[3] J. C. Drummond: Biochem. Jour., 1919, xiii., 91.

[4] Drummond: Biochem. Jour., 1917, xi., 325.

[5] Nineteenth Annual Report of the Imperial Cancer Research Fund, 1922.

[6] S. Wyard: THE LANCET, 1922, i., [illegible]

The experience of Khartoum Civil Hospital in the case of a few selected youths has shown that the Sudanese Arabs can be trained to be useful medical assistants, and in April of last year, although sufficient funds had not been raised, it was decided to commence the medical school buildings. The immediate object is to give a four years' period of instruction to 12 selected young men each year. The proposed curriculum allots two years to pure and applied science and two years to medicine, surgery, midwifery, and hygiene, out-patient attendance being required for the last three years; a diploma will be conferred on successful candidates, practice being limited to the Sudan and based on certain specified conditions. This is the method by which it is designed to obtain a corps of conscientious assistants, accurately trained up to a definite standard, but as soon as the immediate need for doctors has been met in this way, and a suitable teaching staff has been built up, it is proposed to extend the length of the medical course and to bring the curriculum up to the standard demanded by European medical schools. The most promising of the medical assistants will be referred back to complete this fuller course, in addition to other selected youths from the Gordon Memorial College, Khartoum, who would have received preliminary scientific instruction. For the medical school will be an integral part of the Gordon Memorial College, and the trustees and executive committee of that College are being asked to act for the school.

The expenditure involved by the immediate scheme is modest, but substantial, and the money is urgently required that the project, while under weigh, may be completed without delay and its consequent embarrassments. All capital expenditure up to now has been met, and £20,000 remain towards the endowment fund. The close estimates of annual expenditure show that £3000 per annum will be required, to provide for which an endowment fund of £60,000 is needed, but this amount has already been reduced by substantial sums; £40,000 at any rate is still required at once. Owing to the Government being prepared to lend the services of its scientific and medical staff during the initial years of the enterprise, to carry out the teaching in addition to their other duties, the expenditure in this direction is extraordinarily small, while the school is fortunate in that the Wellcome Tropical Research Laboratories are installed in the Gordon College a short distance from the medical school, and the director of these Laboratories will assist in the scientific and medical teaching. If, as all believe, those who help themselves are the people who deserve to be helped, the claim of the Sudanese is a strong one. The natives showed the greatest loyalty throughout the war, they contributed over £31,000 to the Red Cross Fund, and, as has been said, the first £13,000 subscribed in the Sudan for the medical school buildings was for the most part given by the natives of the country. The need then is real and urgent; the work has been begun with confidence in the strength of the appeal; those most directly interested have done their utmost to forward the movement; and the sum asked for is small. In these circumstances we hope that those responsible for the Kitchener Memorial Medical School will have their anxiety with regard to money speedily removed.

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WE understand that the British Red Cross Society is in close touch with the Japanese Embassy in London, and is working in conjunction with a committee formed at the Japanese Embassy, with a view to providing assistance for Japan. So far the question of sending personnel to that country has not arisen. Present information goes to show that what is required is food and clothing, and it is not considered likely that doctors and nurses will be sent out unless a definite appeal to do so is received from the Japanese Red Cross.

Annotations.

"Ne quid nimis"

THE HOSPITAL ALMONER AND SOCIAL SERVICE.

WHEN Florence Nightingale went to the Crimea she found that it was impossible to apply medical treatment without at the same time attending to the more personal and economic wants of her patients. "The fact is," she wrote to Sidney Herbert, "I am now clothing the British Army." The social service work of the present-day hospitals is an outcome of precisely this same necessity, and although the almoners' departments of the voluntary hospitals have always modestly avoided the limelight, an ever-increasing need continues to develop this side of our voluntary hospital system. In this work St. Thomas's Hospital blazed the trail during the pioneer days when vicarious charity was blindly attempting to deal with an impossible problem. Starting in 1905 as a Social Service Office in connexion with the Casualty Department, the almoner's work has steadily increased until the St. Thomas's office deals with 16,000 inquiries in one year, and raises more than £5000 apart from invested income; and there would seem to be every prospect of social service work of all kinds increasing as time goes on. In these days the raison d'être is not far to seek. Few patients present themselves for treatment at hospital who have not got some economic problem the solution of which is intimately related to the cure of their illness. Physician, nurse, and almoner are interdependent. As a good example of this question the latest St. Thomas's report[1] states that during the last seven months of 1922, 295 children were recommended by the out-patient surgical staff for operation for enlarged tonsils and adenoids. Before operation the homes of these cases were all visited by the almoner, and it was found that 200 had homes where the children could receive simple post-operative treatment, whilst 95 had to be admitted to the wards on account of unsatisfactory home conditions. Amongst those refused were found children who, after operation, would have had to share a bed with two or even three other children, or would have had no proper bed at all. In the report of the almoner of the Royal London Ophthalmic Hospital, Moorfields,[2] the value of such inquiries is again emphasised, especially in cases of ophthalmia neonatorum, where every effort, economic and medical, must be made to prevent permanent blindness.

The following up of cases which have been discharged from hospital is yet another service falling to the lot of the social service departments. Both the St. Thomas's and the Moorfields reports show how necessary this task may be in the case of blind patients, for whom suitable employment, on leaving hospital, is often difficult to find. The Moorfields report points out that the giving of small sums of money will not solve the problem of the future for a man who is going blind: he must probably face a year or two of straitened circumstances whilst he is learning a suitable trade, and it is during this period that sympathetic backing from the hospital means everything to him. Some day, perhaps, we shall see established in London a special employment bureau which will concern itself entirely with the welfare of those discharged hospital patients who are only fit for certain occupations and can only work under favourable conditions. Such an invalid employment bureau is greatly needed, but it would require the utmost sympathetic coöperation on the part of employers, trade unions, doctors, and social service workers. Probably only those who work in the departments concerned realise the work that is done by the almoner's office in bridging the gap between the voluntary hospitals and the various State grants. Hospital departments dealing with school-children, pensioners, and tuberculous patients, venereal disease clinics with their hostels and after-care work, maternity and child-welfare centres all find in the almoner a connecting link. It is true, of course, that patients will from time to time abuse the voluntary hospital system by concealing their financial position, but the St. Thomas's report places it on record that on the whole "patients are amazingly honest in their dealings with the hospital, and are apt quite as often to omit some liability, such as the support of an aged parent, as to conceal some source of income." The almoner, in fact, touches life at many points and in all her dealings the aim is not to pauperise but to help patients to help themselves, not to demoralise but to assist these victims of adverse circumstances to develop their own personalities under the stress of difficulties and hard times.

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[1] Annual Report on the Work of the Social Service Department, Samaritan Fund and Northcote Trust, 1922.

[2] Report of the Samaritan Fund and the Work of the Almoner's Department, 1922.

SYMBIOSIS.

SOMEONE has said profoundly that dirt is matter in the wrong place, and the aphorism has been accepted as condensing in a phrase the valuable lesson that much that in some circumstance appears to be merely repellent may in other circumstances be highly beneficent. The discovery of the agencies by which symbiosis is carried on in animals and plants goes one step further in showing that two things may be associated together in conditions hardly distinguishable from parasitism, the partnership being necessary to insure their joint lives, while the word parasitism generally implies mischief to the host. The bacteroids in the nodules of leguminous plants fix the atmospheric nitrogen, and thereby render that nitrogen available for assimilation by the plants; that is a simple example of symbiosis where the micro-organisms carry on necessary work for a common life. Prof. Nuttall, the Quick Professor and Director of the Molteno Institute for Research in Parasitology at the University of Cambridge, made symbiosis the subject of his presidential address at the British Medical Association, and gave many interesting examples of the process in plants, animals, and insects. The subject has been much worked upon recently, and is of interest equally to the physiologist, the pathologist, and the parasitologist. It may easily be imagined that the investigation of the various problems is fraught with difficulties, and sometimes conclusions as to the interrelations of the various bodies cannot yet be arrived at, but Prof. Nuttall concludes that further discoveries are approaching, and that a wide field of fruitful research is open to those British workers who enter upon it

BLOOD PRESSURE IN THE NEW-BORN.

IN a recent communication to the Chicago Gynecological Society, Dr. Ralph A. Reis and Dr. Arthur J. Chaloupka[1] described their observations at the maternity of the Michael Reese Hospital, Chicago, on the blood pressure of 100 new-born infants following normal and pathological labour. The readings were all taken with a mercury manometer and an arm band 6 cm. wide. It was found that the average systolic blood pressure during the first day of life in 55 full-term infants following normal spontaneous labour was 43 mm. Hg, the minimum record being 32 and the maximum 58 mm. There was a gradual daily increase in the blood pressure until, on the tenth day, beyond which, owing to the mothers' discharge from hospital, the observations were not continued, the average reading was 78 mm. The greatest rise was during the first three days, the reading being 59 mm. on the fourth day. As a general rule, the blood pressure was higher in heavy infants. The sex of the infant, the presence or absence of jaundice or fever, the pulse-rate, and caput succedaneum appeared to have no effect upon the blood pressure. Low readings were met with in premature infants and twins proportionate to the birth weight and prematurity, while the greatest increase in blood pressure was shown after midplane forceps extraction and version extraction, and lesser increases after low forceps extraction, relatively dry labours, prolonged second stages, and in infants with large cephalic measurements. The increased blood pressure in all these cases appeared to be due directly to increased trauma to the fœtal head. With clinical improvement the blood-pressure readings gradually approached the normal.

CONGENITAL MIOSIS.

EXTREME contraction of the pupils, apart from the effects of iritis, is generally the result either of spinal disease or of drugs. An instance is recorded in the September number of the *British Journal of Ophthalmology*, by S. Holth of Christiania, where it was due to neither of these causes but was present as a family affection in two sisters and a brother, in each case the condition being permanent, having been noted in two of them as unchanged after an interval of more than 20 years. All three had pupils of about 0·5 mm. diameter, which, after the instillation of mydriatics, never dilated further than 2·5 mm. In one of the sisters the condition was associated with spasm of accommodation, but in the other two cases it was not. The interest of this observation lies in its affording a new instance of family inheritance. The parents were first cousins and the father, who was only seen once, was noted to have rather small pupils, 2·5 mm. in diameter. Two of the affected members died and their eyes were obtained for pathological examination. The anatomical explanation of the condition was pronounced to be the defective development of the dilator muscular fibres of the iris. As to this it might be objected that the dilator muscle of the iris is normally so slight in development that for many years its existence was doubted. On the other hand, the persistence of partial miosis after the use of mydriatics and the permanent nature of the condition negatives the idea that spasm of the contractor muscle can have been the cause, and an affection of the sympathetic was excluded by the instillation of cocaine which enlarged the palpebral fissure while having no effect on the pupil. The only symptom complained of was a certain degree of night blindness owing to the defect of normal dilatation of the pupil in the dark. Two of the three patients were myopic and in their case the daily use of atropine or hyoscine was found to be a sufficient treatment. In the case of a patient who is not a myope, a small optical iridectomy would appear to be indicated.

THE WASSERMANN REACTION IN LEPROSY.

Major R. B. Lloyd, Dr. E. Muir, and Mr. G. C. Mitra,[1] of the School of Tropical Medicine, Calcutta, examined the Wassermann reaction in a series of 286 unselected cases of undoubted leprosy, consisting of 228 adults and 58 children. The adult cases came from the leper asylums of Gobra and Allahabad, and from the out-patient department of the Calcutta School of Tropical Medicine, and the children from the Purulin Leper Asylum. Each blood was tested with three separate antigens—viz., (1) a cholesterinised alcoholic antigen, (2) Noguchi's antigen, and (3) Bordet's antigen, to which 0·4 per cent. of cholesterin was added. Among the adult patients a positive reaction was found in 41·7 per cent. of all cases, in 27 per cent. of the anæsthetic cases, in 47·4 per cent. of the mixed cases, and in 63 per cent. of the nodular cases. Among the children the figures were much higher, a positive reaction being found in 62 per cent. of all cases, in 47 per cent. of the anæsthetic cases, in 80 per cent. of the mixed cases, and in 100 per cent. of the nodular cases. The possible influence of syphilis in causing the positive reactions was investigated by careful inquiry and examination, which elicited evidence of a previous venereal sore in 49 of the adult cases, but of these 15 gave a negative reaction. If it be assumed that the remaining 34 positive reactions were due to syphilis and not to leprosy, this would indicate a syphilitic rate of 14 per cent., which is about the average syphilis rate of the population. Among the children only four showed lesions suggestive of inherited syphilis, and among these the Wassermann reaction was positive in one case, partially positive in one case, and negative in two cases. On the other hand, a control series of 46 untainted children yielded positive reactions in eight cases, or 17 per cent., which, though not inconsiderable, was within the syphilis rate, and was in striking contrast with the high percentage in the leper children.

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[1] Surgery, Gynecology, and Obstetrics, August, 1923.

[1] Indian Journal of Medical Research, July, 1923.

A VISIT TO MEDICAL SCHOOLS IN CANADA AND THE UNITED STATES.

IN the early part of this year Mr. A. E. Webb-Johnson, surgeon to the Middlesex Hospital and dean of the Medical School, visited the principal hospitals and medical schools of Canada and the United States, the itinerary including Quebec, Montreal, Ottawa, Toronto, Boston, New York, Philadelphia, Baltimore, Washington, Cleveland, Chicago, and Rochester. Mr. Webb-Johnson's observations and experiences, communicated to Mr. S. G. Asher, chairman of the Council of the Medical School, and now circulated privately, form a useful contribution to the study of hospital administration. Visiting the Rockefeller Foundation, Mr. Webb-Johnson found the directors committed to the idea of full-time clinical professorships, but elicited the information that little was being done in America for post-graduates, and that the best post-graduate school in the States was the Mayo Clinic. In Philadelphia efforts are being made to enable practitioners to get away for six months or a year in order to take up clinical assistantships. There is in this city a special hospital of 250 beds called the Polyclinic Hospital, which is reserved for post-graduate study. America it seems is considering further provision for her own post-graduates, a problem widely different from that which confronts us. The American undergraduate in medicine does not receive a prolonged clinical training in touch with patients, but is instructed largely by classes, both clinical and laboratory. After obtaining his degree the American post-graduate still needs the clinical experience which our students get while acting as clerks and dressers. Mr. Webb-Johnson's letter is crammed with entertaining things. At the Johns Hopkins Hospital he found convincing evidence of the great advantages of having special departments properly equipped in a general hospital. In a description of the operations of one well-known surgeon, "who now removes for hyperthyroidism the bulk of both lobes of the thyroid," it is stated that in spite of the many vessels to be ligatured under this procedure the operation takes 10–15 minutes only. Being ambidextrous, this surgeon uses a needle at both ends of a suture and stitches with both hands at the same time. Mr. Webb-Johnson saw another surgeon expose the third ventricle and foramen of Monro under local anæsthesia without shock or obvious sign of distress. At a famous clinic elaborate precautions are taken against leaving a sponge inside the abdomen; black tails are fastened to the numbered gauze pads by metal rings which can be identified by X ray examination. At this clinic a report on sections by the freezing method reaches the operating surgeon within two minutes. In regard to the keeping of records there is better stenographic assistance provided for American surgeons, who are therefore in a better position to follow up results; this, Mr. Webb-Johnson drily remarks, is more important than recording the proceedings of committees. In Chicago the American College of Surgeons issues a daily bulletin as a guide to all the operative work in the city, and has a department—open also to foreigners—"which will dive into the literature of any subject in medicine or surgery and for a reasonable fee supply a complete bibliography, with abstracts if necessary." The reprint contains photographs of Harvard Medical School, Boston, of the Medical Building of McGill University, Montreal, of the Rockefeller Institute for Medical Research, New York, of St. Mary's Hospital and the Mayo Clinic, Rochester, together with charts, schedules, and history sheets used in the various institutions described. British surgeons will find it worthy of study.

PROPHYLACTIC INJECTION OF NORMAL SERUM AGAINST MEASLES.

EIGHTEEN months ago attention was called[1] to the work of Dr. R. Degkwitz, of Munich, who produced an immunity against measles by injections of serum obtained from patients convalescent from the disease, and our Berlin Correspondent has recently brought our account of this work up to date.[2] Dr. Gustav Salomon,[3] in combating a severe epidemic of measles in the Waisenhaus and Kinderasyl in Berlin, found that the supply of convalescent serum was insufficient to fill his demand, and as the epidemic was a particularly severe one, and every child exposed to infection contracted it, he experimented with injections (10–15 c.cm.) of serum obtained from adults who had had measles in their infancy. He had the opportunity of dividing his cases (all of whom had been exposed to infection) into three groups—namely, 60 children untreated, 62 treated with M.R.S. (Masernrekonvaleszenten-serum), and 72 treated with adult serum. Of the 60 untreated cases all (100 per cent.) became infected and 58 per cent. died; of the M.R.S. children more than half (59·7 per cent.) were protected, while 16 per cent. died; and of the adult serum cases 52·6 per cent. remained immune and 13·8 per cent. died. Out of the 44 deaths, 34 were consequent on broncho-pneumonia, and 10 died while the rash was out. Of the cases which recovered 13 developed broncho-pneumonia. This complication therefore attacked in all 47 cases, 28 of the untreated, 13 of the M.R.S., and 6 of the adult serum cases. The course of the disease, when it occurred in those who had received prophylactic injections, appeared in most cases to be much milder, abated more rapidly, and showed a longer incubation period than the untreated cases. The M.R.S. used in this series was obtained from infants under one year, and was probably not so rich in antibodies as that used by Degkwitz, which was obtained from older children. This fact may account for the lower percentage of good results as compared with his. The prophylactic injection of adult serum appeared to give approximately a similar protection against measles with regard to the incidence, mortality, course of the disease, and complications as the M.R.S. used in this series.

THE BRITISH JOURNAL OF EXPERIMENTAL BIOLOGY.

THE development of most of the sciences to which medicine is ancillary appears now to have reached a stage in which they can no longer be served, in the opinion of those best qualified to judge, by adhering to descriptive methods. While the special journals recognise this tendency and devote an increasing number of pages to experimental work, some delay in publication has become inevitable owing to the large number of men attracted to this side of the subjects, and the result has been the genesis of journals devoted exclusively to the publication of experimental work. Of these the *Journal of Experimental Physiology* is perhaps the oldest in this country, having reached its thirteenth volume. The *British Journal of Experimental Pathology* was founded in February, 1920, and the first number of the *British Journal of Experimental Biology* is now in our hands. The managing editor,

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[1] THE LANCET, 1922, i., 591.
[2] THE LANCET, Sept. 1st, p. 476.
[3] Deut. med. Wochens., August 31st, 1923.

Dr. F. A. E. Crew, of the Animal Breeding Research Department of Edinburgh University, assisted by a strong editorial board, will consider original articles on experimental embryology, genetics, animal behaviour, the comparative physiology of the lower organisms, and the results of cytological, morphological, and histological investigations which bear directly on matters of current interest to the experimental biologist. Authors are requested to minimise space devoted to historical introductions and theoretical discussions since authoritative reviews of recent progress in various fields of inquiry will be published from time to time. In the first number a critical summary of Tissue Culture, by H. M. Carleton, gives no less than 55 valuable references, though only "the more important papers have been mentioned," and the author deplores the lack of adequate bibliographical references in many of the articles quoted. It is obvious from his conclusions that many of the fundamental discoveries in this work are due to an English observer. The localisation of the factors restraining, inhibiting, or stimulating the growth of tissues can be approached experimentally through the technique of tissue culture, and such research is in direct contact with the problems of causal embryology and with the cancer problem. The original articles in this issue include Studies on Internal Secretion: II., Endocrine Activity in Fœtal and Embryonic Life, by Lancelot T. Hogben and F. A. E. Crew; Studies on the Comparative Physiology of Digestion, (1) the Mechanism of Feeding, Digestion, and Assimilation in the Lamellibranch Mya, by C. M. Yonge; Parthenogenesis in the Mollusc *Paludestrina jenkinsi* (Part I.), by G. C. Robson; Histological Studies on the Domestic Fowl, (1) A Microscopic Study of Sex-Reversal and Hermaphroditism, by Honor B. Fell. The *Journal* will be published quarterly by Messrs. Oliver and Boyd, Edinburgh, the annual subscription being 40s., and we wish it a successful career.

SIR THOMAS BROWNE'S SKULL.[1]

It will be remembered that a peculiar controversy between the Board of the Norfolk and Norwich Hospital, and the vicar and churchwardens of St. Peter Mancroft Church, Norwich, reached a satisfactory conclusion some two years ago. The circumstances were that Sir Thomas Browne, the author of the Religio Medici, who died in 1682, was buried in St. Peter Mancroft, but his skull was stolen from the grave some 160 years later and found its way to the museum of the Norfolk and Norwich Hospital. The vicar and churchwardens of that splendid church, St. Peter Mancroft, were assiduous in attempting to have the skull restored to its original resting place, while the hospital authorities, with a mediæval regard for the relic of a scientific saint, were unwilling to part with the skull. In February, 1922, however, the skull was finally restored to the church, but careful measurements, drawings, and tracings of it were made at the Royal College of Surgeons, so that a memorial might remain of that which is now for ever hidden. There has now been published a monograph on Sir Thomas Browne, dealing especially with the skull in relation to its identity and its verification by portraits written by Miss Tildesley, with an introductory note by Sir Arthur Keith and a report on the endocranial casts by Prof. Elliot Smith. The monograph is a thoroughly sound piece of work. Sir Arthur Keith, who had intended to write it himself, was forced by illness to hand over the task to Miss Tildesley, who has carried it through with enthusiasm and skill—in the words of Sir Arthur Keith, "she has exemplified the best kind of scholarship—one which illustrates the right application of laboratory methods to historical inquiry and to anatomical pursuits." The monograph is profusely illustrated, containing reproductions of the three famous Norfolk portraits, of the portraits at the Royal College of Physicians, London, and at the Bodleian Museum, and beautiful photographs of the skull and the endocranial casts. The scheme for putting on permanent record the physical aspect of the author of the Religio Medici is thoroughly justified. Sir Thomas Browne has won an individual position as author and philosopher, and this monograph should find its way to the shelves of all representative collections. The book has been published by subscription, and we understand that there are still a certain number of copies available to purchasers, who should apply to the secretary of the Biometric Laboratory, University College, London, W.C. The original price of one guinea is being charged for the remaining copies.

SCIENTIFIC EXHIBITS AT THE BRITISH ASSOCIATION MEETING.

Our Liverpool correspondent writes: The British Association meeting this year has an added attraction for the medical profession in its large collection of scientific exhibits. These range from meteorology to practical dyeing, and from preparations illustrating the histology of coal to examples of ultra-modern devices in wireless telephony. Of more direct interest, however, to the medical man are the exhibits of the chemical manufacturers and the scientific apparatus of many kinds for both clinical and experimental work. It is especially noticeable what advances have been made in the production of heat-resisting glass and silicaceous ware. Prices are still high, but are beginning to become more reasonable. It is now possible to buy a good practical Leitz microscope for £18, an oil-immersion lens being £5 extra. A simpler but still useful student's instrument with English lenses can be had for between £9 and £10. Much attention has been paid to the teaching of microscopic work to the student, and some of the apparatus shown would appear to make diagrams—and even lantern slides from actual photographs—things of the past. Two small attachments are exhibited, which enable the teacher to demonstrate a slide directly to the student. One of these is a branched eye-piece, which allows two persons comfortably to examine the same slide at the same time. A movable pointer is an added convenience. Even more practical, and at the same time less costly, is a mirror arrangement which reflects an enlarged view of the field under observation on a sheet of white paper laid near the base of the microscope. Both exhibits can be attached in a moment to any microscope. To the surgeon the instruments produced in stainless steel, though their manufacture is still in its infancy, open up attractive prospects of lessened labour and less frequent necessity for replating, repairs, and renewals. The physician will find the advance of diagnostic methods amply provided for by new instruments of great delicacy and precision, amongst which may be instanced an apparatus for rapidly estimating the reaction of small quantities of body fluids in terms of the hydrogen-ion concentration. There are also to be seen improved and simplified forms of instruments that have already stood the test of time, such as Mackenzie's polygraph. There is a room devoted to the most modern X ray plant that makes its appeal to the clinical worker, as also to the advanced physicist. The visitor comes away with an increased realisation of the part played by the physicist and the chemist in elucidating industrial problems, and an altogether new conception of the rôle of the microscopist in industrial research.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE.

A special post-graduate course, open to all medical practitioners without fee, will be held in the Clinical Theatre of the Unit, St. Mary's Hospital, on Saturday, Sept. 20th, Sunday, Sept. 30th, and Monday, Oct. 1st. On the first day Mr. D. C. L. Fitzwilliams will discuss Early Diagnosis of Carcinoma of the Breast, at

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[1] Sir Thomas Browne: His Skull Portraits and Ancestry. By Miriam L. Tildesley, Research Worker, Royal College of Surgeons' Museum. With 34 plates, frontispiece, and folding pedigree. Reprinted from Biometrika, vol. xv., and issued to subscribers only.

10 A.M. At 11 A.M. Mr. T. G. Stevens will speak on Prolapse, followed by Mr. S. Maynard Smith on Chronic Pain in the Right Side of the Abdomen. In the afternoon, from 2 to 3, Sir William Willcox will discuss Chronic Rheumatic Toxæmia, and from 3 to 4 Dr. Reginald Miller will give a Demonstration of Cases of Cœliac Disease. On Sunday, Sept. 30th, at 10.30 A.M., Dr. C. M. Wilson will deal with (1) The Investigation of Dyspepsia, (2) The Treatment of Diabetes. On Oct. 1st, at 11 A.M., Mr. Aleck Bourne will give a lecture on Anticipation of Mechanical Difficulties in Labour, illustrated by lantern slides. At noon Dr. Wilfred Harris will discuss Encephalitis Lethargica. In the afternoon, at 2 o'clock, Dr. Graham Little will give a lecture on the Diagnosis of Some Common Diseases of the Skin, illustrated by cases, and at 3 P.M. Prof. Frederick Langmead will deal with Some Functional Disorders in Young Children. It will be remembered that a corresponding week-end course initiated last year was well attended; it may be anticipated that this year's course will be equally successful.

ATOMIC PHYSICS.

Physics has always taken a prominent position in the work of the British Association, a fact which is emphasised this year with Sir Ernest Rutherford, Cavendish Professor of Physics, in the presidential chair. There is much for discussion among physicists at the present day, and Sir Ernest Rutherford was happy in the use of such a term as the "Renaissance in Physics" to describe the extraordinary development in atomic physics during the last 25 years. We have to remember that 50 years ago the generally accepted idea of the atom was that of an indivisible unit which could for most purposes be looked upon as a hard elastic sphere. It had to be elastic because it was known to vibrate, and it was just in this respect, with the advances which were then being made in spectroscopy, that the inadequacy of the concept was most acutely felt, for how could such simple elastic spheres be thrown into the hundreds of different states of vibration which their line-spectra necessitated? The discovery of radio-activity upset completely this conception of the atom, and it is probably not overstating the case if we say that the discovery and isolation of the electron, the ultimate unit (at the present date) of negative electricity, by Sir Joseph Thomson has more than any other single discovery led to this overthrow of the older view. And so it comes about that the researches in atomic physics at the present day are largely centred not on the configuration of molecules but on the internal structure of the atom, and it is by a wonderful combination of intuitively directed experiment by Sir Ernest Rutherford himself, combined with the mathematical analysis of Prof. Neils Bohr, that atomic models are being fashioned which will satisfy the various criteria which natural phenomena provide. This trend of modern physics has, among other things, pointed to the relatively enormous amount of energy which is contained in atoms, and speculation upon its availability has not been restricted to the strictly scientific circle. Experiment has shown that by the use of the swiftly flying alpha particles of radium it is possible to penetrate into the interior of other atoms, to cause their disruption, and in this way release more energy than was in the original projectile. There has thus been a gain of available energy, and if such processes could be multiplied in the scale of some millionfold they might take on an economic aspect, although when experiments are undertaken for big scale operations it is frequently found that some compensatory restraining mechanism crops up. It may be so in this case. There can, however, be little doubt that atomic studies are destined to have far-reaching effects on science as a whole; we are left wondering how many years must pass before a future president will discourse to us on the constitution of the "ultimate" particles of to-day, the electrons and protons which form the bricks of the atoms whose inner structure is the revelation of the present century.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXVII.

TREATMENT OF CHRONIC ARTHRITIS.

The crippling forms of arthritis are among the major causes of ill-health, and through their interference with working capacity account for an enormous economic loss. Three main groups can be differentiated—rheumatoid, osteo- and peri-arthritis. Whilst typical examples of each present distinct clinical and pathological pictures, there are cases difficult to classify and others in which more than one type is seen in the same patient. From the point of view of treatment they can be considered together, points of difference being mentioned as they arise. In all, the joint lesions are local, and often late, manifestations of a general disorder. In rheumatoid arthritis, cramps, tingling and numbness of the extremities, "dead fingers," slight signs of hyperthyroidism, and vasomotor instability may precede the arthritis by years. The subjects of peri-arthritis have usually had fleeting attacks of fibrositis elsewhere before the disease settled in the joints. With osteo-arthritis, villous synovitis of the knees or hips or a dry crackling without joint enlargement may precede the formation of osteophytes, and the appearance of Heberden's nodes on the fingers should suggest the possibility of later and more severe lesions elsewhere. Much crippling and suffering could be prevented if these early symptoms were regarded more seriously and search for the underlying infection were made before the establishment of permanent organic changes.

Treatment of the Infection.

Much emphasis has been placed upon the connexion of focal infections with arthritis. In true rheumatoid arthritis these seem to play but a small part, and infection should be sought in connexion with some mucous surface from which widespread absorption can take place. Many patients show defective ferment action, hypochlorhydria, stasis, and an abnormal growth of intestinal streptococci. The "chronic abdominal" type of patient is well represented in rheumatoid arthritis. The urine may give evidence of alimentary absorption in the shape of streptococci, *B. coli*, and oxalate crystals, and a chronic pyelitis may be present. Chronic bronchitis and uterine infections are less common forerunners, but in some patients all mucous surfaces are unhealthy, and suggest lack of resistance to invasion by the normal bacterial inhabitants. Subinfection leads to hyperthyroidism and lowered sugar tolerance, and these in turn aid further infection. In fibro-arthritis, osteo-arthritis, and gouty arthritis, on the other hand, a careful search for focal infections should be made. The rôle of the teeth has been much exaggerated, and one must protest against indiscriminate and wholesale extraction of the teeth of arthritics. Periapical infections and deep-seated pyorrhœic lesions are important; the open sepsis of simple pyorrhœa is less serious unless there be hypochlorhydria, when the swallowing of septic matter may eventually lead to gross infection of the small intestine. The extraction of teeth requires careful and anxious consideration in consultation with a skilled dentist. In simple pyorrhœa much can be done by scaling, massage of the gums, and strict cleanliness. Removal of septic tonsils may be required; small scarred tonsils. are often more dangerous than hypertrophied ones. Enlarged and tender glands beneath the angles of the jaw are good evidence of septic absorption, and the urine may show streptococci of a similar type to those isolated from the mouth or throat or other organisms. The antra and nasal sinuses and the naso-pharynx require careful examination. Gonorrhœa may have opened the path to a secondary streptococcic infection

Dr. F. A. E. Crew, of the Animal Breeding Research Department of Edinburgh University, assisted by a strong editorial board, will consider original articles on experimental embryology, genetics, animal behaviour, the comparative physiology of the lower organisms, and the results of cytological, morphological, and histological investigations which bear directly on matters of current interest to the experimental biologist. Authors are requested to minimise space devoted to historical introductions and theoretical discussions since authoritative reviews of recent progress in various fields of inquiry will be published from time to time. In the first number a critical summary of Tissue Culture, by H. M. Carleton, gives no less than 55 valuable references, though only "the more important papers have been mentioned," and the author deplores the lack of adequate bibliographical references in many of the articles quoted. It is obvious from his conclusions that many of the fundamental discoveries in this work are due to an English observer. The localisation of the factors restraining, inhibiting, or stimulating the growth of tissues can be approached experimentally through the technique of tissue culture, and such research is in direct contact with the problems of causal embryology and with the cancer problem. The original articles in this issue include Studies on Internal Secretion: II., Endocrine Activity in Fœtal and Embryonic Life, by Lancelot T. Hogben and F. A. E. Crew; Studies on the Comparative Physiology of Digestion, (1) the Mechanism of Feeding, Digestion, and Assimilation in the Lamellibranch Mya, by C. M. Yonge; Parthenogenesis in the Mollusc *Paludestrina jenkinsi* (Part I.), by G. C. Robson; Histological Studies on the Domestic Fowl, (1) A Microscopic Study of Sex-Reversal and Hermaphroditism, by Honor B. Fell. The *Journal* will be published quarterly by Messrs. Oliver and Boyd, Edinburgh, the annual subscription being 40s., and we wish it a successful career.

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[1] Sir Thomas Browne: His Skull Portraits and Ancestry. By Miriam L. Tildesley, Research Worker, Royal College of Surgeons' Museum. With 34 plates, frontispiece, and folding pedigree. Reprinted from Biometrika, vol. xv., and issued to subscribers only.

10 A.M. At 11 A.M. Mr. T. G. Stevens will speak on Prolapse, followed by Mr. S. Maynard Smith on Chronic Pain in the Right Side of the Abdomen. In the afternoon, from 2 to 3, Sir William Willcox will discuss Chronic Rheumatic Toxæmia, and from 3 to 4 Dr. Reginald Miller will give a Demonstration of Cases of Cœliac Disease. On Sunday, Sept. 30th, at 10.30 A.M., Dr. C. M. Wilson will deal with (1) The Investigation of Dyspepsia, (2) The Treatment of Diabetes. On Oct. 1st, at 11 A.M., Mr. Aleck Bourne will give a lecture on Anticipation of Mechanical Difficulties in Labour, illustrated by lantern slides. At noon Dr. Wilfred Harris will discuss Encephalitis Lethargica. In the afternoon, at 2 o'clock, Dr. Graham Little will give a lecture on the Diagnosis of Some Common Diseases of the Skin, illustrated by cases, and at 3 P.M. Prof. Frederick Langmead will deal with Some Functional Disorders in Young Children. It will be remembered that a corresponding week-end course initiated last year was well attended; it may be anticipated that this year's course will be equally successful.

ATOMIC PHYSICS.

PHYSICS has always taken a prominent position in the work of the British Association, a fact which is emphasised this year with Sir Ernest Rutherford, Cavendish Professor of Physics, in the presidential chair. There is much for discussion among physicists at the present day, and Sir Ernest Rutherford was happy in the use of such a term as the "Renaissance in Physics" to describe the extraordinary development in atomic physics during the last 25 years. We have to remember that 50 years ago the generally accepted idea of the atom was that of an indivisible unit which could for most purposes be looked upon as a hard elastic sphere. It had to be elastic because it was known to vibrate, and it was just in this respect, with the advances which were then being made in spectroscopy, that the inadequacy of the concept was most acutely felt, for how could such simple elastic spheres be thrown into the hundreds of different states of vibration which their line-spectra necessitated? The discovery of radio-activity upset completely this conception of the atom, and it is probably not overstating the case if we say that the discovery and isolation of the electron, the ultimate unit (at the present date) of negative electricity, by Sir Joseph Thomson has more than any other single discovery led to this overthrow of the older view. And so it comes about that the researches in atomic physics at the present day are largely centred not on the configuration of molecules but on the internal structure of the atom, and it is by a wonderful combination of intuitively directed experiment by Sir Ernest Rutherford himself, combined with the mathematical analysis of Prof. Neils Bohr, that atomic models are being fashioned which will satisfy the various criteria which natural phenomena provide. This trend of modern physics has, among other things, pointed to the relatively enormous amount of energy which is contained in atoms, and speculation upon its availability has not been restricted to the strictly scientific circle. Experiment has shown that by the use of the swiftly flying alpha particles of radium it is possible to penetrate into the interior of other atoms, to cause their disruption, and in this way release more energy than was in the original projectile. There has thus been a gain of available energy, and if such processes could be multiplied in the scale of some millionfold they might take on an economic aspect, although when experiments are undertaken for big scale operations it is frequently found that some compensatory restraining mechanism crops up. It may be so in this case. There can, however, be little doubt that atomic studies are destined to have far-reaching effects on science as a whole; we are left wondering how many years must pass before a future president will discourse to us on the constitution of the "ultimate" particles of to-day, the electrons and protons which form the bricks of the atoms whose inner structure is the revelation of the present century.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXVII.

TREATMENT OF CHRONIC ARTHRITIS.

THE crippling forms of arthritis are among the major causes of ill-health, and through their interference with working capacity account for an enormous economic loss. Three main groups can be differentiated—rheumatoid, osteo- and peri-arthritis. Whilst typical examples of each present distinct clinical and pathological pictures, there are cases difficult to classify and others in which more than one type is seen in the same patient. From the point of view of treatment they can be considered together, points of difference being mentioned as they arise. In all, the joint lesions are local, and often late, manifestations of a general disorder. In rheumatoid arthritis, cramps, tingling and numbness of the extremities, "dead fingers," slight signs of hyperthyroidism, and vasomotor instability may precede the arthritis by years. The subjects of peri-arthritis have usually had fleeting attacks of fibrositis elsewhere before the disease settled in the joints. With osteo-arthritis, villous synovitis of the knees or hips or a dry crackling without joint enlargement may precede the formation of osteophytes, and the appearance of Heberden's nodes on the fingers should suggest the possibility of later and more severe lesions elsewhere. Much crippling and suffering could be prevented if these early symptoms were regarded more seriously and search for the underlying infection were made before the establishment of permanent organic changes.

Treatment of the Infection.

Much emphasis has been placed upon the connexion of focal infections with arthritis. In true rheumatoid arthritis these seem to play but a small part, and infection should be sought in connexion with some mucous surface from which widespread absorption can take place. Many patients show defective ferment action, hypochlorhydria, stasis, and an abnormal growth of intestinal streptococci. The "chronic abdominal" type of patient is well represented in rheumatoid arthritis. The urine may give evidence of alimentary absorption in the shape of streptococci, *B. coli*, and oxalate crystals, and a chronic pyelitis may be present. Chronic bronchitis and uterine infections are less common forerunners, but in some patients all mucous surfaces are unhealthy, and suggest lack of resistance to invasion by the normal bacterial inhabitants. Subinfection leads to hyperthyroidism and lowered sugar tolerance, and these in turn aid further infection. In fibro-arthritis, osteo-arthritis, and gouty arthritis, on the other hand, a careful search for focal infections should be made. The rôle of the teeth has been much exaggerated, and one must protest against indiscriminate and wholesale extraction of the teeth of arthritics. Periapical infections and deep-seated pyorrhœic lesions are important; the open sepsis of simple pyorrhœa is less serious unless there be hypochlorhydria, when the swallowing of septic matter may eventually lead to gross infection of the small intestine. The extraction of teeth requires careful and anxious consideration in consultation with a skilled dentist. In simple pyorrhœa much can be done by scaling, massage of the gums, and strict cleanliness. Removal of septic tonsils may be required; small scarred tonsils are often more dangerous than hypertrophied ones. Enlarged and tender glands beneath the angles of the jaw are good evidence of septic absorption, and the urine may show streptococci of a similar type to those isolated from the mouth or throat or other organisms. The antra and nasal sinuses and the naso-pharynx require careful examination. Gonorrhœa may have opened the path to a secondary streptococcic infection which alone persists and requires treatment. The alimentary tract must be examined for stasis, ulceration, and catarrhal inflammations. Chronic appendicitis or cholecystitis must be considered. Organisms may be grown from the washed mucus from the stools or obtained from the duodenum by a tube. Washing out the small intestine by a saline purge after feeding for a few days with lactose may provide active culture material. A very thorough clinical and bacteriological examination has thus to be made in every case and the results assessed. Only in early cases with one or two accessible foci of infection will removal alone cause improvement; but in later cases we may at least reduce the amount of subinfection.

Vaccine treatment is employed to raise the resistance of the patient to the infection whatever its source. The initial dose should not exceed five millions, and should be very gradually increased, injections being made every five to seven days. That dose which is just below that necessary to produce a reaction should be aimed at. Much vaccine treatment of arthritis is ineffective because it is stopped too soon, with too small a final dose; 1000 to 2000 millions may be reached by careful intensive treatment.

Intravenous Protein Therapy.—The use of intravenous injections of proteins has added a definitely useful agent to our therapeutics, the mechanism of action being somewhat obscure. My own experience has been chiefly with albumoses, typhoid and *B. coli* vaccines, these latter being used purely as a source of protein. With typhoid or *B. coli* vaccine a suitable initial dose would be 30 millions, injections are given every fifth day—usually not more than six in all—the dose being gradually increased according to the effect, up to 200 millions, the dose varying with the patient and the activity of the vaccine. With albumoses I find 0·2 c.cm. of a 5 per cent. solution of Armour's peptone, No. 2, gives a satisfactory response. The injection is followed in a few hours by a rigor and a rise of temperature to 102°F. or thereabouts. During this negative phase there is a focal reaction in the joints with increased pain, followed by defervesence, sweating, and a positive phase in which the joints are less painful and stiff and the patient experiences a sense of well-being. In subacute cases of multiple peri-arthritis the result may be remarkable; rheumatoid and osteo-arthritic lesions show less improvement, but even here this treatment combined with vaccines yields better results than do other methods. The patient willingly bears unpleasant immediate effects for the sake of the after improvement, and the shortened period of treatment is also of advantage from the hospital standpoint. Intravenous protein therapy should not be used with old and feeble patients or those with myocardial disease.

General Treatment.

Clothing.—Most arthritic patients are overclothed. Layers of heavy woollen clothing keep the skin in an unhealthy, moist, unduly warm condition. Silk or cotton mesh, frequently changed, is preferable.

Climate.—The desirability of a warm, dry climate and of residence on a gravel or sandy soil has been exaggerated; no climate will be found suitable so long as the infective causes remain. Abundant sunshine is of more importance; heliotherapy where tried has given hopeful results.

Diet.—Sugars and soft, starchy foods should be restricted. Rheumatoid patients require a gradual introduction to a generous diet with milk, eggs, meat, abundant fats, and fresh, tender vegetables. Stout osteo-arthritics require a reducing diet, with milder proteins and abundant vegetables. Hot water should be taken before meals, and no fluids with them.

Local Treatment of the Joints.

During the acute phases the joints should be kept at rest *in a proper position.* The majority of advanced cases have their joints fixed in bad positions, brought about in the earlier stages by attempts to get the joints into the position of greatest ease, which is usually that of flexion; as a result adaptive shortening of flexors and stretching of extensors occurs with ankylosis of the joints. Knees and hips should be fixed in extension, if necessary by the use of weights. The elbow should be at right angles and the wrist somewhat hyper-extended. If the patient is unwilling to stay in bed for slow extension by weights he may wear one of the excellent mechanical contrivances which cause traction and take the weight of the body off the joints.

Relief of Pain.—In the early stages some relief of pain will be brought about by the rest and extension. Further relief can be obtained by the application of dry heat, preferably radiant heat. A small lamp with a parabolic reflector, such as that made by the General Electric Company, Moor-street, Birmingham, or the "Thermolite" lamp by Menley and James, is convenient. Hot sand packs provide a homely substitute. After the heat, analgesic applications such as camphor and menthol or methyl salicylate can be applied. The muscles should be gently massaged, but the joints themselves must not be rubbed.

Duration of Rest.—It may be that the best that can be done is to leave the patient with a quiet joint ankylosed in a good position, but more often the question arises—How long should the joint be at rest? No definite rule can be given, but when the temperature is normal and the pain and swelling have subsided changes in position can be made, followed by gentle passive movements. With further improvement active movements are commenced, and the patient must be encouraged to use his joints. Later on we have to deal with stiffness and possibly contractures by stimulating liniments of camphor and turpentine, and by iodine and mercury. This is also the time for hydrotherapy in its various forms and the skilled bathing and massage to be obtained at spas will help to increase mobility. At home the patient may be trained to react favourably to cold baths of graduated temperatures, radiant heat being continued. Ionization may be of use by warming the tissues and stimulating metabolism; diathermy is also of great value.

Orthopædic Treatment.—Patients with partially or completely ankylosed joints may need manipulation under anæsthesia; this requires extreme care and should not be attempted so long as there are signs of activity. There is grave risk of fracturing the bone or rupturing blood-vessels and nerves. When the joint is reduced ankylosis is again allowed in the best position. In a few cases arthroplasty may be possible, especially in cases of ankylosis of the jaw, fixation of the elbow in extension, and ankylosis of several joints in the same limb Complete bony ankylosis gives better results than painful fibrous ankylosis; young adults are the best subjects. Much judgment is required in selecting cases for operation, and prolonged after-treatment is essential.

Drug Treatment.—No drug has a specific action on arthritis; guaiacol carbonate, guaiacum and sulphur, iodides, arsenic, collosol sulphur, and collosol iodine have their advocates. Drug treatment is mainly symptomatic. With rheumatoid arthritis, ac. hydrochlor. dil., min. 20, well diluted after food helps to correct the hypochlorhydria and intestinal infection. Liquid paraffin, collosol kaolin, and dimol may be used for intestinal stasis together with a proper fitting abdominal support. Thyroid is of great value in advanced rheumatoid cases with hypothyroidism and the osteo-arthritis occurring at the climacteric. In acute fibrositis saline diuretics should be used. Hæmatinics can be prescribed for anæmia. Acetosalicylic acid is useful, but is apt to be abused. For catarrhal conditions of throat and nose an atomizer with collosol argentum may be used several times a day and the tonsils swabbed with 10 per cent. argyrol.

The future of these cases is not so hopeless as was once thought. In most cases improvement can be brought about and sometimes the results of treatment are brilliant. No disease requires more patience and perseverance, and the suggestive therapeutics of hope and confidence are more valuable than drugs.

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Special Articles.

THE INTERNATIONAL HEALTH OFFICES.

PROPOSALS FOR NEW USEFULNESS.

THE Assembly of the League of Nations, in the intervals of its political preoccupations and anxieties at Geneva, has before it the important proposals of the representative Commission of official public health experts, presided over by Dr. A. Granville, President of the Maritime and Quarantine Board of Egypt, which was appointed in the spring to advise on the lines on which the League's Public Health Organisation should be permanently established.

The Basis of Permanent Organisation.

Hitherto the health work of the League has been conducted by a Provisional Health Committee nominated by the Council and representing ten European and four non-European countries, and by the public health section of the Secretariat of the League, under the directorship of Dr. L. Rajchman. This organisation has carried on its work side by side with the older international public health office in Paris—the Office International d'Hygiène Publique—established by the Convention of Rome, 1907, to which certain countries not members of the League—notably the United States—are parties. The members of the League's Provisional Health Committee are in the majority of cases also the official delegates of their countries to the Paris office, and consequently have been able in large measure to secure that the work of these two international organisations has not unduly overlapped. Moreover, each of the two Presidents, Dr. Madsen (Denmark) and M. Velghe (Belgium), is a member of the other's organisation. All the same, it has become evident that, if two official international health organisations have for the present to be maintained as the result of political and other circumstances, something must be done to coördinate their work, officially and formally, and to establish principles on which the utilisation of the Paris office and the Paris International Committee on the one hand, and the Geneva office and Health Committee on the other, can be naturally and automatically determined. The Third Assembly of the League decided last year that international public health should in future be undertaken as part of the permanent activities of the League, and in working out the details during the present Assembly the League has a great opportunity of getting the desired coördination established by general consent. The report of the Granville Commission proposes that the official Government delegates to the Office International in Paris (who constitute the Standing Committee of that body) should undertake the duty of acting as the General Advisory Body on which the League would rely, and should also accept the duty of nominating the greater part of a Standing Health Committee of the League itself. These proposals keep intact the functions of the Paris office as established under international convention, and, incidentally, have the advantage of basing the medical work of the League on an existing organisation on which the public health services of any country in the world can readily be represented. In effect, they would secure that the regular Committee of the Office International d'Hygiène Publique, which has good work and official experience to its credit, will in future be greatly strengthened through the fact that, subject to the Council of the League of Nations, it will obtain an executive body, able to carry out approved international investigations with the resources of the League behind it—an important consideration when it is remembered that the small budget of the Paris office is limited by its statutes to a sum far smaller than is necessary for effective international work.

A Wealth of Publications.

Consideration of the administrative questions which are now before the Assembly as a result of the report of Dr. Granville's Commission, recalls the magnitude and number of the official international publications which have been appearing for the last two or three years. In addition to the monthly published Bulletins of the Office International d'Hygiène Publique, we now have twice a year the Minutes of that office, which sits in Paris for ten days in May and October, and also the Proceedings of the Provisional Health Committee of the League of Nations, the most recent of which, that of the Sixth Session, has just been issued as a volume of 126 folio pages (League of Nations document C. 424, M. 187), obtainable from Constable and Co. The Health Section of the Secretariat of the League has also issued a number of separate reports on particular conferences and missions, and on epidemic diseases in Eastern Europe. It also publishes a monthly "Epidemiological" Report compiling current returns of notifiable diseases in different parts of the world, which have been gathered together by a sub-department concerned with "Epidemiological Intelligence and Public Health Statistics," directed by Mr. E. Sydenstricker and financed by the Rockefeller Foundation. Study of these various documents provokes the immediate reflection that the coördination desired by the Granville Commission is already badly needed. Few subjects are to be found which are not being treated both by the Office International d'Hygiène Publique and by the Health Committee of the League from their respective points of view, and much cross reference is necessary if the experience of any particular country or the views of any particular delegate are required. It is to be hoped that this is only an incident in a useful evolutionary stage of the development of official international health work. Certainly the publications as a whole leave no doubt of the great progress which has been made at Paris and at Geneva in developing machinery by which the various public health services of different countries are brought together for comparison of data, and for international agreements on matters which require them. Both series of reports, with their wealth of reference, should find a place, together with the monthly Bulletin of the Office International d'Hygiène Publique, in every public health library. It should be understood that the notes below merely illustrate certain sections of the work which is recorded in the most recent of these publications.

International Differences in Cancer Mortality.

This subject was introduced to the Paris office in October, 1922, by Sir George Buchanan, the British delegate, and was made the subject of a preliminary questionnaire, the results of which were reported in May by the same delegate in conjunction with Dr. Major Greenwood, Medical Statistical Officer of the Ministry of Health. The questionnaire was designed as a preliminary inquiry by which the material available for statistical investigation in each country could be ascertained. It appeared that there was unanimity of opinion that cancer is an increasing or, at the least, a non-diminishing cause of mortality in all the civilised nations represented. This opinion was not vitiated by the universally recognised fact that statistical ratios of mortality are liable to various errors of record, some generally applicable and others special to the circumstances of particular countries. The importance of comparative study and analysis of hospital figures is fully recognised, but it is concluded that no country can so far be said to provide records of hospital mortality suitable for the purpose. Notable inter-local differences of mortality have been established in certain countries, in particular a relatively high mortality in the centre part of Sweden as compared with the rest of that country, and in the departments of Emilia and Toscana as compared with the rest of Italy. The constancy of this localisation extends over a considerable period of time, and is not, in the opinion of the reporters, to be accounted for as a matter of record. Recorded cancer mortality shows a very high variation even between the countries in which death certification and registration are most highly developed. This, however, does not carry with it corresponding variations in the rates of mortality at adult ages from all causes. Italy, for example, which has a much lower mortality from cancer than England and Wales, Holland, Norway, and Sweden, has a smaller mean expectation of life at ages 30 and 60 than any of these countries.

Sir George Buchanan and Dr. Greenwood emphasise the value which the replies of the different countries to the questionnaire regarding the nature of the material available for study possess for permanent reference; these replies have now been published in the June and July numbers of the *Bulletin* of the Office International d'Hygiène Publique. It is considered that they will afford a directory and an index indispensable to those who are undertaking international comparison of cancer figures in one or another direction. The reporters suggest one such international comparison as a starting-point, and emphasise the practical value of selecting and concentrating on definite parts of the statistical field. Taking three countries in which registration of causes of death has long been well developed, they present the following contrast between England and Wales, Italy, and Holland :—

Cancer Mortality of Special Sites Expressed as Rates per 10,000.

—	Cancer of the breast (female).			Cancer of the female genital organs.		
	England and Wales.	Italy.	Holland.	England and Wales.	Italy.	Holland.
1911	1·84	0·58	0·98	2·43	1·48	1·17
1912	1·97	0·55	1·19	2·46	1·40	1·27
1913	2·02	0·59	1·08	2·55	1·50	1·40
1914	1·99	0·59	1·10	2·50	1·51	1·31
1915	2·02	—	1·12	2·46	—	1·32
1916	2·11	0·56	1·15	2·47	1·49	1·22
1917	2·13	0·56	1·10	2·56	1·40	1·30
1918	2·07	—	1·12	2·54	—	1·34
1919	2·20	—	1·27	2·55	—	1·44

These are very striking differences, the meaning of which it ought to be possible to ascertain by a carefully planned inquiry, and it is satisfactory to note that the consideration of this report by the Paris office, and subsequent reference of the subject to the League of Nations Health Committee, has led to the appointment by the League of an international committee authorised to coöpt experts and prepare a scheme for the necessary investigations.

Comparative Data in Other Diseases.

A similar collection of information regarding the prevalence of goitre and its treatment, in the hands of Dr. Carrière, the Director of the Swiss Public Health Service, is in progress. In the enteric group the Paris minutes contain instructive contributions from the representatives of some of the Eastern European States such as Roumania and Bulgaria, illustrating the large extent to which wholesale antityphoid vaccination has lately been adopted to combat these diseases among the civil population. The reports contain many references to the present position of epidemic typhus. A notable feature of this disease in Algeria has been that a recent migration of the population from the villages to the towns as a result of drought has led to a very great increase of typhus of the severe type. Figures illustrating the vast extent of recent typhus in Russia are given in the League of Nations volume and in the special epidemiological reports. It is still impossible to obtain any check on these figures, which relate to cases of the disease, by a study of the corresponding deaths, no death returns under causes being available in Russia. There seems to be no doubt, however, that typhus at length after many years shows definite evidence of diminution, while fortunately through a number of circumstances the intensive infection brought into Poland and other countries to the west of Russia, as a consequence of the movements of refugees and repatriated persons from Russia, has virtually stopped. To this fact may be attributed a great reduction in the number of typhus cases in Poland during the past winter, where the weekly number of new cases reported never passed a maximum of 500. In connexion with relapsing fever, which has accompanied these European epidemics, it is interesting to refer to a report to the Office International d'Hygiène Publique by Dr. Gouzien on an outbreak of this disease affecting large tracts of Senegal and French Gambia. It was estimated that since 1919 as many as 80,000 deaths have occurred from this cause. Treatment by injections of "914" were found very effective, but appeared to have the disadvantage of reducing the resistance of the patient to subsequent infection. An account was also given to the Paris office by Dr. Lutrario, the Italian Director-General of Public Health, on an outbreak of ictero-hæmorrhagic spirochætosis of Ronciglione in 1921, causing an epidemic of 800 cases, which terminated by the occurrence of chronic sickness characterised by inguinal buboes.

Malaria and Sleeping Sickness.

The League of Nations Health Committee has recently decided on special investigations in connexion with both these diseases. In May last the British member presented to the Committee a note from Lieut.-Colonel S. P. James, adviser on malaria to the Ministry of Health, in which the great increase of malaria in some of the endemic centres in Europe during and since the war was considered, and a plea was put forward for study of the circumstances responsible for the spread of the disease in the different countries affected. Such an investigation would probably show that some of the preventive methods commonly recommended on tropical experience are not the most effective or most economical for the affected countries in Europe. In many of them only a small amount of money is available for preventive measures; it will not be practicable to employ several systems at the same time, and investigation is needed to determine the one likely to be most effective in the particular instance and concentrate on it. Recent observations in France, Denmark, Holland, and England on the causes of the disappearance of malaria from those countries, and of the failure of the disease to spread in them after the war, may have a very practical bearing on this subject, while thorough inquiry is needed from the point of view of economy into the utilisation of quinine. Following this note the Health Committee appointed a Commission under the direction of Dr. Lutrario with power to coöpt malariologists and undertake local inquiries and other research work. This Commission has the task of collecting and examining information with regard to the epidemiology of malaria and the prophylactic measures adopted, as well as of advising the health administration of different States which may apply to the Commission for assistance.

The inquiry into sleeping sickness in tropical Africa is in the hands of another Commission of the League, consisting of Dr. Andrew Balfour, Dr. Van Campenhout, and Dr. Martin, to which body Dr. Bagshawe, Director of the Tropical Diseases Bureau, London, has now been added. On behalf of this Commission, Dr. Balfour has now presented to the Health Committee a report representing the information available from various sources as to the incidence and distribution of sleeping diseases in the African countries concerned. This report will shortly be published from Geneva. It indicates the need of close practical coöperation between the Egyptian Sudan, Belgian Congo, and French Equatorial Africa on account of the spread of the diseases within those regions and from one country to the other.

International Agreements and Questions of Standardisation.

The minutes of the May meeting of the Office International d'Hygiène Publique show that the proposals for revision of the International Sanitary Convention, 1912, to which so many sessions have been devoted, are now completed and in the hands of the French Government for negotiations with the various powers in order that the final form of the next Convention may be settled by a general International Sanitary Conference. The need for a revised Convention becomes daily more evident, and there will be general satisfaction among those who are responsible for measures of port sanitary administration and quarantine when the date of the Conference is definitely fixed. A minor but collateral question, lately considered by the Health Committee of the League, is that of the international arrangements to prevent carriage of infection that should be made between riparian states which are traversed by large navigable waterways such as the Danube. An annexe to the minutes of the sixth session of the Health Commitee contains a draft model convention for the health control of traffic on waterways prepared with this object by Dr. Chodzko (Poland) and Dr. Lutrario (Italy). Other questions of regularising international practice in the interest of public health and shipping, some of which may require to be included in official international agreements, are those of flags and signals which should be used for various purposes of quarantine, the scope and form of bills of health, and the methods which should be officially considered adequate for the destruction of rats on ships. All these subjects, and in particular the increasing adoption of hydrocyanic acid gas for rat destruction, were fully discussed at the last session of the Office International d'Hygiène Publique, which also received a useful note prepared by Dr. J. A. Mitchell, the chief health officer for the Union of South Africa, on the use of wireless messages in quarantine work.

Another class of work for necessary standardisation must be mentioned. As is well known, the League's Health Committee, through the energy and activity of its President, Dr. Th. Madsen, has already secured some most valuable and practical agreements between bacteriologists and administrators for the unification of certain antitoxic sera and serological tests. The conclusions of the Serological Conferences held at Paris and Geneva on the subject, under the auspices of the League, have already been fully reported, and various joint laboratory investigations which were there decided upon are now being pursued. This year a further step was taken, again on Dr. Madsen's initiative, to obtain an international understanding regarding the units of strength and the methods of testing which should be applied to biological remedies or to drugs which, like digitalis, require to be standardised by biological means. A special conference of physiologists and pharmacologists on these subjects was arranged by the League in Edinburgh in July at the time of the International Physiological Congress. Further publications will be issued from Geneva on these two branches of work, and in both British scientists, acting through the Medical Research Council and otherwise, have fully participated.

Special Activities of the Geneva Health Office.

The provisional health organisation of the League administers the special fund raised for the anti-epidemic measures in Eastern Europe which have been carried out by the League's Epidemic Commissioners. This fund is nearing exhaustion, but owing to the receipt of £5000 through Dr. Nansen, in the early part of this year, it was found possible for the Commissioners to accept the invitation of the Greek authorities and undertake an intensive campaign for the vaccination of the refugees swarming into that country from Asia Minor and Thrace. A very instructive account of this campaign is given in the minutes of the Health Committee in the form of reports submitted by Dr. Rajchman and Dr. Wroczynski. Within two or three months some 700,000 vaccinations were performed against small-pox and 975,000 inoculations of tetravaccine against the enteric group and cholera were given. The whole work appears fully to have merited the special commendation which it recently received from the Council of the League. It may be added that a general investigation of public health problems in the Far East is now being undertaken by Dr. F. Norman White, the Chief Epidemic Commissioner.

The other special funds at the disposal of the League's health organisation—those given by the Rockefeller Foundation—have fortunately not only been continued, but have recently been increased by a special contribution for international statistical services. With the aid of these funds a bureau with a large staff has been formed at Geneva for epidemiological and statistical studies, while considerable progress has been made with the various schemes of "interchange" between the public health and laboratory officers of different countries. The courses of instruction for foreign medical officers of health already held in Belgium, Italy, and Great Britain are now being continued by a course in the United States, and the programme of 1924 covers a second British course, and others in Holland, Switzerland, and the Scandinavian countries. What are termed "specialist" interchanges are also being arranged for tuberculosis and school medical officers; a special course in regard to antimalaria work has already been held in Italy with useful results.

From the above examples it may be concluded that if the present movement for better coördination and consolidation of the work of the two international health offices takes shape, those who are concerned with their future direction will be in no need of a fresh programme. The little group of Government health representatives of different countries, which has laboured so hard at Paris and Geneva to show the practical advantage of international coöperation, has already successfully opened up new and promising lines of progress in practical hygiene, and the coördination should be welcome, perhaps not so much for its opportunities of further increasing the number of medical subjects considered internationally, as for providing means by which the various studies and projects for international arrangements which have now been started can be steadily pursued and brought to satisfactory conclusions.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The Census Figures for 1923.

THE census returns of the Austrian Republic, taken on March 27th of this year, give the total population as 6,526,661. Of these 3,382,568 are females and 3,144,093 are males. The female population has thus reached again the figure of the year 1910, whilst the males still number 141,255 less than at that date. The excess of females is 76 per 1000 males—a higher figure than in 1910, but a lower one than in 1920. Whilst in the rural districts there is an increase in the numbers of both sexes over the 1910 figure, in Vienna and the industrial districts the population has decreased. In three counties only the females have exceeded the figures of 12 years ago. The female population has increased everywhere at a more rapid rate than the male. The ratio of males to females is highest in Wienerneustadt, 1000 : 1003, and lowest in Baden, 1000 : 1268. The birth-rate for the years 1919–21 stands at 17·96, 22·40, and 25·10 per 1000 respectively, while the death-rate figures for the same period are 20·33, 18·97, and 17·06 per 1000. The effects of the war on the census figures are slowly being obliterated. This is also noted in the public elementary schools. Whilst in 1920 the number of children in the first standard of the lowest forms was 20 per cent. less than the previous year, and in 1921 it decreased still further, this year a rise of over 15 per cent. is recorded. These are the children born in 1917, when part of the army had to be sent back home owing to unrest in the front lines; their return home resulted in a rise of the birth-rate. The improved care of the newborn and the young children up to 6 years has caused a marked drop in the mortality figures of these age-periods, so that relatively more children have reached the school age. In the higher forms of the schools the number of children is as yet much lower than in the last five years.

Suppression of Venereal Disease: Police Suggestions.

At the recent international meeting of the police, which took place in this city, reports were made having a bearing on medical subjects. A suggestion was made by the head of the Vienna police to abolish the control of prostitution. He advocates strongly compulsory treatment of all persons, both male and female, found suffering from venereal disease. It is interesting to note that this demand has been brought forward in several instances by medical men at meetings of preventive societies, and that in the Austrian National Assembly's archives there are deposited several Bills dealing with this matter, but which had to be shelved owing to adverse public opinion.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Care of War Victims.

DURING the war and after the German Government, no less than other belligerent Governments, had a heavy burden to bear in the caring for the wounded and providing for the families of the fallen. According to a report recently published, the total casualties in the army and navy amounted to 1,846,293 killed and 4,247,864 wounded. The care of the disabled was formerly entrusted to the local military authorities—the so-called Bezirkscommandos, who in addition had many other duties to fulfil—e.g., the control of the conscripts and the reservists, under the supervision of the War Office. When this military organisation was abolished under the Peace Treaty, the care of the disabled was transferred to the Ministry of Labour and was dealt with by special district offices—Versorgungsämter. Up to the present these offices have settled the claims of 1,537,000 injured and of 1,945,000 dependents. Under the former system the disabled man received his pension and had himself to provide treatment, but the present law provides for the free treatment of disablement due to war service. This enables any one case to be studied as a whole and ensures continuity of treatment. The treatment is, as a rule, carried out by a benefit society; for those who are not members of such societies the Government has appointed medical officers. There are still 70 military hospitals in use throughout the country, and these are given over to the care of the injured. In the German spas the Government have 16 sanatoriums at their disposal, nine of which belong to the Treasury, the others having been taken over temporarily. Private accommodation for invalids is also available in numerous health resorts and spas. In 1922 some 14,500 patients were sent to these institutions. In the tuberculosis sanatoriums 2700 beds are reserved for war victims. In 63 towns and districts there are centres for orthopædic treatment, and necessary appliances, &c., are supplied to patients. A great number of medical officers who formerly belonged to the Army Medical Corps are now attached to the Versorgungsämter.

Accidents Due to Drunkenness.

Dr. Mühsam, chief surgeon to the Moabit Hospital in Berlin, states in the *Vossische Zeitung* that the number of accidents due to drunkenness has greatly increased. He points out that the spread of drunkenness which has grown of late in Germany might well be combated not only by the Government but also by the benefit societies and workmen's insurance clubs, which are called on to pay the costs of treatment, already very high, in such cases of accident.

Height and Weight in Children.

The German Health Office published the results of an inquiry into the height and weight of school-children taken during a period from 1913 to 1922 in the cities of Stuttgart, Leipzic, Munich, Augsburg, Mannheim, Freiburg, Mulhouse (Thüringen), Königsberg, and Spandau. These cities differ much in size and are situated in different parts of Germany. The statistical tables show that boys are taller and heavier than girls of the same age, except at the time of puberty from the eleventh to the fifteenth year. The pupils of the secondary schools are much taller and heavier than the pupils of the elementary schools. The children lost greatly in weight and in size during the war. In Stuttgart the average weight of boys of 10 years fell from 27·9 to 25·7 kg., but this loss had disappeared at the last period of the inquiry which ended in the spring of 1922. It is, however, to be feared that as the supply of food has become again scarce the weight of the children may soon be reduced once more to the war-time level.

Treatment of Tuberculosis.

Prof. Dührssen recently read a paper before the Berlin Medical Society on a new treatment of tuberculosis by inhalations discovered by Prof. Weniger, a German medical man residing in Rio de Janeiro, Brazil. The remedy consists of a mixture of uranium, thorium, manganese, and certain acids which form a new compound, called nitoplasmin. By permeating the capsule of the tubercle bacilli it destroys the toxic and infectious substances, and further it strengthens the immunising substances within the body cells. The daily inhalation of Weniger's compound has no obnoxious or disagreeable effect, the patients, on the contrary, state that they are able to breathe more freely; the sputum first increases, but the discharge is easier and the general state improves, so that they are able to work again. This change was especially notable in graver cases. The condition of the lungs showed an improvement, even at the end of three weeks. Every case was examined before and after the cure by radiographic and bacteriological methods. Dr. Dührssen stated that during his stay in Rio de Janeiro he had seen hundreds of patients who had been cured by Weniger's method within a few months. His own experiences had also been very satisfactory, and he recommended the treatment to the profession.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal health statistics of the city of Leeds and five county boroughs. If it is justifiable to group the first three as dirty-aired towns and the last three as comparatively clean-aired towns, it is suggestive that the average death-rate of the first group from disease of the respiratory system with influenza is 2·3, while that of the second group is 3·8, and that the difference is greater than the total tuberculosis mortality rate in any of the six towns.

Name of town.	Estimated population (R.G.)	Birth-rate.	Death-rates per 1000 of population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality. Legit.	Infant mortality. Illegit.	Maternal mort. in childbirth.
Leeds C. ..	466,700	19·8	13·9	1·4	1·3	2·9	97	166	3·4
Wigan C.B. ..	91,750	22·4	14·2	1·2	0·6	4·0	108	93	3·6
Bury	57,400	16·5	14·9	0·9	1·2	4·4	71	274	6·3
East Ham	145,800	21·0	11·0	1·2	1·2	2·7	61	118	1·6
Derby	132,400	20·8	11·3	1·1	1·2	2·2	68	144	1·9
Bournemouth ..	81,500	13·8	14·0	1·2	1·7	2·0	53	109	5·3

C.= city. C.B.= county borough.

Leeds.

Dr. J. Johnstone Jervis reports that owing to the numerous conversions of premises into flats (55 houses were converted into 260 flats in 1922). Regulations for underground sleeping rooms under Section 17 of the Housing Act of 1909 have been adopted and submitted to the Ministry. The control of common lodging-houses has been transferred from the Watch Committee to the Health Committee. Application will shortly be made to the Ministry to extend the definition of offensive trades to include fried-fish shops and rag and bone dealers. The local Fish Friers' Association approve the former proposal as they are anxious to have the unsuitable premises brought up to the high standard of the majority. Dr. Jervis, in dealing with the smoke nuisance, says the railway companies are among the worst offenders. Lectures for stokers were arranged at the Technical School in November and December, and were well attended. Out of about 7000 observations (one hour each) of chimneys during 1921 and 1922, there were 556 cases where chimneys emitted dense smoke for three minutes. There were no prosecutions in either year.

The Milk Order has met with a poor reception so far in Leeds, licences having been issued to one retailer for "certified" milk and to one for "pasteurised." The two corporation farms have, however, recently been licensed for grade A (tuberculin tested) milk and supply two sanatoriums, the Infants' Hospital, the residential nursery, and the one remaining day nursery (the other three day nurseries having been closed as unnecessary). About 10 per cent. of the milk samples were returned as adulterated. The inspection of cow-sheds shows that the country cows compare very unfavourably with the city cows for cleanliness. Dr. Jervis comments on the culpable negligence shown in protecting meat, bread, fish, fruit, &c., from contamination. Mussels from Lytham and Hoylake are excluded from the Leeds market on account of sewage contamination. There is urgent need for more hospital accommodation for acute bronchitis and pneumonia. Another need is an increase in the ambulance service, for dealing with maternity cases amongst others.

The percentage of persons abandoning treatment at the V.D. clinic before cure is complete reached the low figure of 7·8 in 1922. Dr. Jervis is very dissatisfied with the tuberculosis scheme and does not think the reduction of the tuberculosis death-rate from 1·74 in 1913 to 1·40 in 1922 is a result commensurate with an expenditure of £116,444 during the last ten years. Other people might think the expenditure well worth while if they could feel assured the reduction was due to it. Dr. Jervis goes on to say that if half the money spent on tuberculosis were spent on slum clearance and better housing the result would be much more satisfactory. Well, the Government is now offering Leeds £2500 a year for 20 years (total £50,000) towards slum clearance, to which Leeds will presumably add a like amount, making a sum in all not far short of half the Leeds tuberculosis expenditure. However, it is futile to talk of scrapping tuberculosis expenditure altogether, and Dr. Jervis recognises this when he says "A proper sanatorium built on up-to-date lines is badly wanted," and welcomes the gift of "The Hollies," a mansion which will accommodate 50 children and "be a valuable addition to the general scheme for the treatment of tuberculosis in the city." At the same time everyone will sympathise with Dr. Jervis's desire that more should be done to strengthen the resistance of contacts and to secure the complete convalescence of children after debilitating illnesses "by the establishment of recuperative centres and preventoria up and down the whole country:"

Wigan.

Dr. Henry Whitehead is able to report that the scheme for conversion of privies and pail-closets to the water-carriage system has been begun and that great progress has been made in dealing with insanitary houses. Proper receptacles are needed for house refuse, up-to-date vehicles for its removal, and Dr. Whitehead emphasises the need for watering the streets before sweeping in dry weather. The construction of a public slaughter-house is under consideration. An inspection of the gathering grounds of the Wigan water-supply has revealed sources of pollution. Chlorination has been adopted for two of the three supplies and steps to prevent the pollution are being considered. Two additional maternity and child welfare centres have been established. Advantage is to be taken of the Government-assisted scheme for dealing with unhealthy areas, and two such areas are at present being carefully considered. Dr. Whitehead's school report shows that many things are lacking. There is no arrangement for the treatment of tonsils and adenoids. A residential open-air school and an open-air day school are needed and either a special school or more special classes in order to carry out the statutory requirements for the education of mentally and physically defective children. An additional school clinic is wanted. There is ample work for a whole-time dental surgeon, but the school dentist at present only gives three half-days a week to inspection and treatment. A recently completed inspection has shown that the sanitary condition of the schools leaves much to be desired.

Bury.

Dr. G. Granville Buckley shows that the phthisis and infant mortality rates were the lowest ever recorded. He issues a warning as to the neglect of vaccination. At present only one child out of every five born is vaccinated. Bury is setting an example to the mill towns in smoke abatement. There were two prosecutions, one of which resulted in a £5 penalty, the other being dismissed. In over 4 per cent. of the chimneys observed, black smoke was emitted in excess of the limit of 2 minutes in 30 laid down by the Bury Council. One observation showed $28\frac{1}{2}$ minutes black smoke and $1\frac{1}{2}$ of moderate smoke in 30 minutes!

East Ham.

Dr. W. Benton reports that an up-to-date steam disinfecting station is needed. An agreement has been made with West Ham Corporation for dealing with small-pox cases.

Judging from Dr. Benton's report as school medical officer, the East Ham Education Committee do not take their duties very seriously. Only children whose acuteness of vision is $\frac{6}{18}$ or less are offered the chance of treatment at the school ophthalmic clinic.

The two rooms occupied by the dental clinic were built as store-rooms and are totally unfit for the practice of dentistry. The system of charging has interfered with the attendance and retarded the work. The appointment of at least one more dental surgeon is urged. The dental needs of children over 10 years cannot be systematically dealt with. The school dentist, Mr. Cyril S. Neame, who also treats cases sent by the maternity and child welfare centres, comments on the wonderful improvement in the health of the mothers treated (although to his regret he has not the facilities to provide dentures), and mentions that it is no uncommon thing for him to treat babies of 19 months who have septic mouths and require three or four extractions. The results of past years' work are becoming evident in the lessened amount of oral sepsis among the scholars.

Dr. Benton emphasises the need from the preventive point of view for proper provision being made for the large number of delicate and pre-tuberculous children in day and residential open-air schools and schools of recovery. From the lack of a cleansing and disin- fecting centre for the treatment of uncleanliness, scabies, and other skin diseases the education of many children is interfered with. During 1922, 12,145 school sessions were lost by children suffering from such conditions, as compared with 10,113 in 1921.

There are no special centres available for the education of physically or mentally defective children unable to attend ordinary public elementary schools. A remedial clinic, with massage, &c., is needed for cases of infantile paralysis, spinal curvature, &c. Dr. Benton points out that the scheme in operation for securing payment from parents for the cost of treatment has resulted in a setback to the work of following up, and that the school nurses are likely to become unwelcome officials rather than friendly advisers. The primary consideration, he urges, should be to secure treatment, and the financial question should form no part of the duties of members of the school medical service.

Derby.

Dr. Albert E. Brindley tells us that 1922 was a "measles" year. There were 2618 cases notified, with only 12 deaths, and this lower mortality as compared with past measles years he claims as being in no small measure due to the educational efforts of the health staff. The figures for 1922 show that the death-rate among hand-fed babies was nearly four times that of those naturally fed. Dr. Marion Knowles, maternity and child welfare medical officer, says the work of the dental clinic grows slowly, but that the old idea that nothing can be done for the teeth during pregnancy dies hard. She is anxious that the clinic should provide dentures for the mothers in necessitous cases. Dr. W. H. Wray, tuberculosis officer, states that an endeavour is being made to limit admissions to the sanatorium to early cases and to increase the length of stay. The average stay per patient was increased from 90 days in 1920 to 196 days in 1922. Nine shelters are on loan for continuing sanatorium treatment at home, and Dr. Wray thinks this method might be usefully extended. Two cases of anthrax of the localised type occurred during the year. In each case the patient worked at a tannery and was treated successfully by operation at the Derbyshire Royal Infirmary. The source of origin was said to be imported goat skins.

Bournemouth.

Dr. A. D. Edwards thinks the Registrar-General has considerably under-estimated the population. He therefore gives some of the principal statistics obtained on his own estimate of 93,770 and on the Registrar-General's of 81,500 side by side. For purposes of comparison between the various towns the only equitable method is, obviously, to accept the Registrar-General's estimates. Perhaps, too, it is better for a health resort to be stimulated by an over-estimated death-rate than lulled to sleep by an under-estimated one. The Corporation housing scheme consists of 164 houses, 162 built by contract and two presented to the town by the Builders' Guild. Each house contains at least three bedrooms, a parlour, and bathroom. The weekly rents, inclusive, except for water-rate, are as follows :—

Ministry type.			Number.
B.	3-bedroomed semi-detached ..	12s. 6d.	88
B4.	4- „ „ „ ..	14s. 0d.	6
B.	3- „ in block of 4 ..	12s. 6d.	60
B4.	4- „ detached.. ..	15s. 6d.	4
B.	3- „ „	14s. 0d.	6

The applicants were divided into Bournemouth ex-Service men married with families, married without families, and single; and Bournemouth non-ex-Service men and non-Bournemouth ex-Service-men similarly subdivided. Nearly all the tenancies were allotted to Bournemouth ex-Service men with families. Four of the four-bedroomed houses have been adapted, so that each may accommodate two families, each co-tenant being responsible to the Corporation for half of the rent. On written application the committee may grant permission to sub-let, provided the sub-tenancy includes a sitting-room, a bedroom with fireplace, and joint use of scullery fittings, bathroom, and water-closet. The sub-tenant is liable for not more than half of the rent and water-rate, which he pays to the tenant. On Dec. 31st, 1922, there were 37 sub-tenancies recorded in the register. The committee may grant permission to keep poultry. The number is limited to eight fowls, and the height of the hen-house to 5 ft. On Dec. 31st, 1922, there were 75 poultry runs. The erection of 18 sheds for cycles, &c., has been permitted up to the present.

The public analyst, Mr. R. A. Cripps, reports that four of 21 samples of cream illegally contained a boron preservative, and that samples of sponge cake contained boric acid up to 31½ gr. per lb. The boric acid in the latter case is used to preserve the liquid eggs used for making the sponge cake. Of 21 samples of green peas 16 contained copper, in four instances undeclared. It is customary in Bournemouth not to take proceedings if the presence of copper is declared on the label and the quantity does not exceed 2·0 gr. of sulphate of copper to the lb. of peas. Penalties of £2 and £1 11*s.* 6*d.* costs were obtained in respect of five samples, the highest amount of copper sulphate present being 4·1 gr. to the lb. In a sample of lime-juice cordial about half the acidity was due to adulteration with phosphoric acid. Mr. Cripps comments on a successful defence of this practice in London, when it was claimed to be an improvement. He is still of opinion that this practice is a gross fraud, and suggests that if it is permissible to replace the natural constituents of a foodstuff by cheaper substitutes under the specious plea of "improving," the manufacturer might advertise the "improvement" on the label and there would then be no prejudice to the purchaser, especially if the price charged corresponded with the reduced cost to the maker.

SCHOOL MEDICAL SERVICE.

Derbyshire.

DURING the year 26,744 children were medically examined, 26,389 of these coming under the routine age-groups. Of the latter 6702 were referred for treatment, and during the year 2505 children received treatment for eye trouble, 3605 for ear disease. Operations for diseased tonsils and adenoids were performed upon 1155 children, and these are excluded from school for two weeks after operation; 151 cases of ringworm were treated by means of X rays.

Dr. Sidney Barwise demonstrates that the boys and girls in Derbyshire are taller and heavier than the average of the same class in England and Wales, but in the later ages the advantage is not maintained. Examination of the secondary school-children reveals the fact that postural deformities, with the exception of flat-foot, are much less common in boys than in girls. Of 816 boys examined, 54 had more or less flat-foot; 2 per cent. had colour blindness. Of 1803 girls examined in the secondary schools 270 had enlarged or septic tonsils and adenoids. Goitre was present in 194. In the more marked cases it was fairly easy to persuade the parents to have the condition treated, but in far too many of the milder cases it is still regarded as just Derbyshire neck—something that runs in the family. Tables are given showing the personal equation of the doctor in discovering and recording defects, the percentage of children referred for all conditions varying in different doctors' districts from 33·6 to 11·5 per cent. During the year 861 children were excluded from school: 105 because they were verminous, 755 for medical reasons, 287 of these being on account of tuberculosis. There were 17 permanent exclusions from school, 7 of them being on account of mental condition, 2 for epilepsy, and 2 for defective vision.

Dr. Mary Gallagher gives the results of 983 cases of enlarged tonsils and adenoids upon which she had operated. In one-half of these cases the condition had caused secondary complications, such as suppurating middle-ear disease or chronic catarrh of the middle ear with deafness, chronic inflammation, and discharge from the nose. In a considerable number of cases operation had to be deferred owing to treatment for anæmia, septic teeth, &c., having to be carried out. In one case the child had to be treated for six months before she was fit for operation; considerable pains have been taken to follow up these cases. Of the 983 cases operated on, 890, or 90 per cent., were discharged cured and 83 improved. In 10 cases there was no improvement. In several cases operations were performed on children who had already been operated on with the guillotine—that is, a piece of the tonsil had been sliced off, and after a short time the symptoms had unfortunately recurred. The cardiac condition of 30 children was such that the operation was performed without an anæsthetic.

The school dentist submits an interesting report. He finds that out of the number of children inspected 80 per cent. were referred for treatment and 20 per cent. actually treated. He insists that any propaganda for the prevention of caries in children must depend on the teachers. Dental extractions amounting to 19,936 and 13,526 dental fillings were accomplished. This is a considerable increase on the figures for previous years; more than twice the number for 1920 and three times that for 1918. The extra work was accomplished at a comparatively small increase of expenditure by the use of dental dressers. It would be interesting to compare the cost per head for 1922 and 1918. The employment of dressers for the unskilled work is found to reduce working costs considerably, with no loss of efficiency. Sanction has been granted by the Board of Education for the continuance of this experimental scheme for a further two years, by which time, it is hoped, it will have thoroughly vindicated itself.

Derbyshire Education Committee are certainly to be congratulated on the consistent way in which they have tackled the problem of treatment of defects found among the rising generation. As long ago as 1909 they started a scheme for dental treatment. They were also pioneers in the introduction of X ray treatment for ringworm, which has made such a difference in school attendance statistics all over the country. They have established a specialist service conspicuous by its conscientious work. The medical and nursing staff here have had to be reduced in the interests of economy, but it is to be hoped that the economy campaign will not deal too ruthlessly with a scheme of treatment built up with so much care and foresight.

STORY OF THE SMALL-POX EPIDEMIC IN GLOUCESTER.

AT a special meeting of the Health Committee of the City of Gloucester held on Sept. 7th, a report on the circumstances of the recent small-pox epidemic in that city was read. This report was approved and adopted by the committee with only one dissentient. The following extracts from the report outline the main facts attendant on the outbreak of the disease and on the administration of the powers of the local authority in dealing with it. The extracts embody suggestions for the better working of the Public Health Services, arising from conclusions arrived at by the acting medical officers of health and approved by the Health Committee. The report states:—

Prior to the month of June, in March and April, only six cases of small-pox in the city had been *notified, registered, and reported as such to the Ministry of Health*. These cases were all sent to the small-pox hospital at Longford and were in due course discharged; and at a meeting of the council on May 30th the chairman of the Health Committee (Councillor Wood), relying on the report of the medical officer of health, stated that the city was then quite free from small-pox.

Cases Diagnosed as Chicken-pox.

On June 1st Dr. J. R. Hutchinson, a medical officer of the Ministry of Health, came to Gloucester and late in the evening had a conference with the Mayor (Councillor J. O. Roberts), the chairman of the Health Committee, Alderman Dr. Knight, and the medical officer of health (Dr. Bibby), and stated that he had been sent to Gloucester by the Ministry to inquire as to the existence of small-pox in the city, having regard to the fact that although cases were notified in surrounding districts, some of which were believed to have become infected from Gloucester, no cases were being notified from Gloucester, that he had visited a number of cases which had been notified as chicken-pox and found them to be small-pox, and that he had found other cases of small-pox which had not been notified in any way. As it appeared that the medical officer of health questioned Dr. Hutchinson's diagnosis, it was agreed that Dr. Hutchinson should arrange for an expert to come to Gloucester and report upon some of the cases. In the evening of the following day (June 2nd) Dr. Hutchinson returned to Gloucester with Dr. A. F. Cameron (medical superintendent of the rivers hospitals and ambulance services of the Metropolitan Asylums Board) and had a conference with the Mayor, the chairman of the Health Committee, and the town clerk, when Dr. Hutchinson reported that since their arrival they had seen the medical officer of health and examined about 16 patients, Dr. Cameron agreeing with Dr. Hutchinson that, with the exception of one case of chicken-pox, all the patients examined were suffering from small-pox. Dr. Hutchinson intimated that the course to be adopted was fully explained in Memorandum 71a issued by the Ministry in November last (which was laid before the Health Committee when issued, and again in March last), but he also made a number of suggestions for the guidance of the committee.

On June 3rd Dr. Cameron and Dr. Hutchinson had a further interview with the Mayor, when Dr. Cameron stated that he had examined 15 more patients, making 31 in all, and that, with one exception, they were all suffering from small-pox.

A special subcommittee was formed to consider any question arising in connexion with the outbreak of small-pox with power to deal with any matters of urgency.

Appointment of Dr. W. H. Davison.

At a meeting on June 11th of the special subcommittee formed to deal with the outbreak the chairman reported that he had been to Birmingham and, through the kindness of the corporation of Birmingham, had arranged for Dr. W. H. Davison (assistant medical officer of health) to come to Gloucester for a month to assist the medical officer of health in dealing with the outbreak of small-pox. It was then resolved—

"That Dr. W. H. Davison be requested to deal with all notifications of small-pox and chicken-pox, arrange as to the course to be adopted for investigating, dealing with and following up such cases, and generally dealing with the epidemic; and that he be given plenary powers with regard to such matters, including authority to give directions to the staff of the health department and visit patients in hospital."

At a meeting of the Health Committee on June 15th it was temporarily arranged (subject to the sanction of the Minister of Health) for Dr. Davison to perform any of the duties of a medical officer of health, in connexion with the existing outbreaks of small-pox and chicken-pox in the city and measures for preventing the spread of such diseases; and he was accordingly appointed to perform all or any of such duties with all the powers of a duly appointed medical officer of health. The committee also passed a resolution recommending the council to delegate to them and to the special subcommittee, during the present outbreaks of small-pox and chicken-pox or until further order, authority to exercise any of the powers of the local authority or corporation under the Public Health Acts, 1875 to 1907, the Infectious Disease (Prevention) Act, 1890, and the Gloucester Corporation Acts, 1894 and 1911, with respect to those diseases and measures for preventing the spread thereof; and such recommendation was duly approved and adopted by the council. The hospital at Brockworth was opened for the reception of patients on June 15th.

Difficulties of Public Health Administration.

At a special meeting of the council on June 20th Dr. Davison read a report dealing with the epidemic in which he stated that as the outbreak had been allowed to go unchecked for such a long time, great difficulty was experienced in getting patients to agree to removal to hospital. There were certain influences at work endeavouring to foster this resistance and throw sand on the administrative machinery designed to protect the community. An emergency meeting of the Health Committee was held on June 23rd. Dr. Davison stated that the present conditions made it impossible for him to continue to take administrative charge of the epidemic, and referring to the fact that he had pointed out that it was a ridiculous position to have in charge of small-pox cases a medical superintendent who did not admit the cases to be small-pox.

Resignation of Dr. J. R. Bibby.

At a special meeting of the Health Committee on June 25th the chairman referred to the fact that at the last meeting it was explained that the subcommittee had suggested to the medical officer of health that, having regard to his views about the epidemic, he should temporarily relinquish all duties in connexion therewith and that he had refused to do so. After hearing the report of members of the committee who had since seen the medical officer of health, it was resolved—

That it be recommended that, as far as practicable, and until further order, the medical officer of health (Dr. Bibby) be relieved from all duties connected with the diagnosis of cases of small-pox and chicken-pox and the admission to hospital of cases of small-pox and their subsequent treatment and discharge; and also from the superintendence, administration, and visiting of the hospitals at Longford and Brockworth.

At the same meeting Dr. Davison stated that it would be necessary to obtain additional medical assistance, and it was decided to apply to the Metropolitan Asylums Board for two suitable men. This resulted in Dr. R. W. Jameson and Dr. G. R. Painton coming to Gloucester on June 27th, when it was arranged that Dr. Jameson should take charge of the hospital at Brockworth, and that both should assist Dr. Davison generally in dealing with the epidemic. At a meeting of the special subcommittee on June 29th Dr. Davison advised that Dr. Jameson and Dr. Painton should be authorised to exercise the powers of a medical officer of health, and a resolution recommending that course was passed, and in due course approved by the council and the Minister of Health.

Dr. Bibby sent in his resignation as medical officer of health for the City and the Gloucester Division of the Customs Port of Gloucester, which was accepted.

At a meeting of the Health Committee on July 6th Dr. Davison reported that at 9 o'clock that morning there were 230 patients at the Brockworth Hospital. In connexion with the medical assistance which the committee have had in dealing with the epidemic, it should be mentioned that Dr. C. Killick Millard, medical officer of health of Leicester, had intended to take a holiday in Switzerland, but in order to assist Dr. Davison very kindly spent three weeks of his holiday at Gloucester, without any remuneration beyond hotel expenses and railway fares—a service which has been much appreciated.

Incidence and Treatment of Small-pox in the City.

As many cases of small-pox had been wrongly diagnosed as chicken-pox instead of small-pox, and therefore had not been isolated, it was found when Dr. Davison came that there were a number of cases of small-pox in the city and it was necessary to deal with such cases and their contacts. This was done in a very thorough manner, and contacts were kept under surveillance and offered vaccination. The largest number of patients in the hospital at any one time was 254, the total number admitted up to date being 507; but all have now been discharged, except 13, and it is hoped the epidemic is practically over. The admissions for the week ended noon, Sept. 4th, were two, in different houses, both contacts who had developed the disease.

Mild Type of Small-pox.

The epidemic is referred to as "mild" small-pox as some 70 per cent. of the cases have been very mild, 25 per cent. moderately severe, and 5 per cent. severe, with only three deaths, only one of which was caused by uncomplicated small-pox, and this an infant 6 weeks old, small-pox being a contributory factor in another death, and not even a contributory factor in the third death, though the patient had a mild attack. Owing to the mildness of most of the cases, some persons appear to have mistaken them for chicken-pox, but the subcommittee were advised that they were certainly small-pox, and that is not only the opinion of the experts engaged by the council and most of the medical men in the city, but that diagnosis has been confirmed by many medical officers of health and other medical men who have visited the hospital. As showing that the disease is quite distinct from chicken-pox, the subcommittee are informed that it has been found that the one disease is not a protection against the other, and that, while vaccination is a protection against small-pox, a person suffering from the disease cannot be successfully vaccinated.

This mild type of small-pox is stated not to be new. A circular letter was recently issued by the medical officer of health and assistant medical officer of health of Bristol to medical practitioners of that city stating that they had had an opportunity of seeing cases of the present outbreak in the Gloucester Hospital and found that they *resembled in every particular* the mild cases which were being constantly introduced in Bristol in 1903-4, and as constantly stopped from spreading by the loyal coöperation of the medical profession, and pointing out the urgent importance that it should not be mistaken for chicken-pox.

As far as is known to Drs. Painton and Jameson, the Gloucester epidemic appears to be strictly comparable and indeed identical with what has been going on in Yorkshire, Derbyshire, and the Midlands during the last two years, and something of the same kind appears to have been met with in America where, in order to distinguish it from the more virulent type, it is sometimes called alastrim. The consensus of medical opinion and the evidence seem to show that the disease is undoubtedly small-pox and quite distinct from chicken-pox, though the patients have not suffered from some of the more severe symptoms met with during the epidemic of 1896. As showing that a mild case may cause a much more severe one, reference may be made to cases which occurred in one family in June last. A girl, aged 12, had an exceedingly mild attack. She gave it to a brother aged 14, who was one of the worst cases dealt with. It is very important, the report states, that cases of small-pox should be promptly and carefully isolated; but apart from any question of wrong diagnosis, it would appear that, as in 1896, there have been cases of concealment.

History of a Typical Case.

C. N. S. was admitted as a patient at the small-pox hospital on August 30th. From the report of Dr. Painton it appears that on August 25th the patient, who had been at home unwell since the previous Thursday, sent for a doctor, and was seen by Dr. L., who thought he was suffering from influenza. On the following Thursday, August 30th, as the patient had not been to work for a week, his employer requested a doctor to find out why he had not come to work, and as a result Dr. L. again saw C. N. S., and reported at the health office that he was suffering from what he considered to be an attack of small-pox and asked that Dr. Painton should see the case. Drs. Painton and Jameson visited the case the same day and found it to be undoubtedly one of small-pox and the patient was willingly removed to the small-pox hospital. The patient has since been seen by a number of local medical men and also by two experts who all agreed that the patient was suffering from small-pox, one of the experts certifying that "the illness and present condition are typical of the disease," and the other that "the symptoms and features of his illness are quite characteristic."

The prodromal history of the case is described in the following statement made and signed by the patient on Sept. 1st:—

> I was first ill on Thursday morning, feeling dicky, headache, pains in my legs and as if I had an influenza cold coming on. I laid down till dinner-time and then sat about. Feeling a bit better on Friday morning I stayed in house and garden on Friday. On Friday afternoon I felt a lowering pain in my lower back across from one side to the other. On Saturday morning, after the night's rest, I felt a bit better. Later in the day about dinner time I felt I was going to be bad and sent for Dr. C. Dr. L. came. I was in bed when he came. I felt queer. I felt hot over my body, just as if a cold was coming on from Friday morning on till Monday. I ate my dinner on Sunday, but did not enjoy it. On the Thursday the pain in my legs was very bad. I felt better on Monday and went to Court. On the Tuesday morning, when I got up at 8 o'clock, I noticed spots on my arms. The rest of the rash came out on the same day, Tuesday, just as it is to-day. No rash came out on the Wednesday. Dr. H. saw me on Sunday, Monday, and Tuesday, and he called again on Wednesday night to count the spots on my little girl's hand, and he looked at my hands and face again then.

The local authority and those helping them have had to contend with great difficulty and obstruction in dealing with the epidemic, and it is pointed out that the public must realise that unless steps are promptly taken to correctly diagnose doubtful cases and to notify cases which ought to be notified, they will always be liable to epidemics and the trouble and expense resulting therefrom.

The Reporting of Notifications by the M.O.H. to the Ministry of Health.

When a notification is sent in it is to be assumed that the case is one for investigation and the notification should be acted upon unless, as a result of consultation with the medical officer of health, or otherwise, the person making the notification should feel justified in withdrawing or revising it; but if a medical officer of health should not agree as to the correctness of the diagnosis of a case as notified by a medical practitioner, the proper course would appear to be for the medical officer of health to report the notification to the Ministry of Health with his own view of the case in order that any doubt as to the diagnosis may be promptly decided. If that course had been adopted in Gloucester, any question of diagnosis might have been dealt with in January, at which time recent inquiries show that the disease existed, instead of June, all the early cases might have been promptly isolated in the hospital at Longford, and, in all probability, the anxiety and great expense involved in connexion with the hospital at Brockworth and the isolation and treatment of a large number of cases therein might have been avoided, as well as the indirect but far greater loss to traders and others resulting from the adoption of a wrong course and the wide publicity given to the matter in the public press.

The general facts with regard to the epidemic are shortly summarised in this report; but much valuable information is contained in reports made from time to time to the subcommittee by Drs. Davison, Painton, and Jameson, and particularly in the following: (1) Report by Dr. Painton on the epidemic viewed from the administrative point of view; and (2) report by Dr. Jameson on the hospital aspect of the epidemic.[1] While referring to such reports the subcommittee desire to place on record their great ciation of the very valuable assistance rendered by)avison, Painton, and Jameson, and of the able manner ich the epidemic was dealt with by them when called though it had been allowed to get widely distributed gh the city.

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[1] Copies of the Reports of Drs. Painton and Jameson are being printed with reproductions of the photographs, maps, and charts, and a limited number of copies may be obtained from Messrs. L. A. Smart and Sons, Northgate-street, Gloucester. Price 10s. 6d.

Questions Raised by the Epidemic.

conclusion, the report makes the following ments:—

e facts connected with the epidemic raise questions eat importance which seem to require careful tigation, and it would appear desirable that the stry of Health should consider the circumstances ng up to and connected with or incident to the emic, and also consider the following and other lental matters:—

The adequacy of the provisions of the Infectious ase (Notification) Act, 1889, and the need for nding the same or amending or more clearly ning the duties of medical officers of health, so as nake sure that cases notified shall be investigated properly dealt with.

The need for adequate facilities for ascertaining ther any inmate of a dwelling-house is suffering n an infectious disease. This appears necessary as admission of the acting medical officer of health for a time refused; and, although there is power entry for a variety of purposes, there does not ear to be any for a case of this sort.

. Having regard to the fact that this mild type of ll-pox is *very infectious*, though some persons ear uncertain about the diagnosis, it appears essary for the protection of the country generally t prompt and reliable measures should be taken to and deal with cases which may occur; and as mpt isolation of cases is essential for the protection the country at large, it is submitted that this uld be enforced by the Ministry, and that the cost, a large part of it, should be contributed out of ernment funds.

THE DENTAL STUDENT.

A GUIDE TO TEACHING INSTITUTIONS IN DENTISTRY.

'HE Students' Number of THE LANCET, which eared on August 25th, contained information ly to be of use to those who propose to take up tal surgery as their career in life. An account was re given of the functions of the Dental Board, of conditions for registration as a dental student, of the examining bodies in dentistry. Of teaching itutions those connected with the several univeres were described in some detail, but in addition to se there are a number of institutions which offer lities to dental students and which are now set under their localities.

LONDON.

Royal Dental Hospital of London, School of Dental rgery, Leicester-square.—A school of the University London, and women are now admitted as students l are eligible for all hospital appointments and ool prizes. The school provides the special dental ication required by the Royal College of Surgeons the Licence in Dental Surgery. The general part the curriculum may be taken at any general spital. The hospital is open from 9 A.M. to 5 P.M., re being one staff for the morning and another for afternoon of each day. Pupils are received for training in dental mechanics recognised by the riculum. The instructors at the commencent of each session give a course of lectures on erative Dental Surgery. The five house surgeons are held for six months each and are open to all alified students. The lecturers, in addition to ir lectures, give special demonstrations on the croscopy of Dental Anatomy and Dental Surgery. e lecturer on Dental Mechanics also gives practical monstrations in the laboratory. There is an trance Scholarship in Chemistry and Physics of the value of £50. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25, open to pupils of the Hospital only. One Entrance Scholarship of £25 in Dental Mechanics, open to pupils of private practitioners. The Saunders Scholarship of £20 and Saunders Prize of £5 awarded to second year students. The Storer Bennett Research Scholarship for Scientific Research in any branch of Dental Surgery, value £50, is awarded triennially. The Alfred Woodhouse Scholarship of £35 and the Robert Woodhouse Prize of £10 for Practical Dental Surgery. Prizes and certificates are awarded by the lecturers for the best examinations in the subjects of their respective courses at the end of the summer and winter sessions. Fee for two years' hospital practice required by the curriculum, including lectures, £70 in one payment, or £73 10*s.* in two yearly instalments. The curriculum requires two years to be passed at a General Hospital; the fee for this is about £68 5*s.* Both hospitals can be attended simultaneously. For the lectures in Chemistry and Physics for the Preliminary Science Examination £13 13*s.* The fee for the instruction in Dental Mechanics and the two years' hospital practice required by the curriculum is £200 if paid in one instalment, or 200 guineas if paid in three equal instalments. The fee for tuition in Dental Mechanics is £70 per annum; for one year's hospital practice £28. The Winter Session opens on Oct. 1st.

University College Hospital Dental School, corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Chemistry, Physics, Anatomy, and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the National Dental Hospital, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. Composition Fees: Comprising two years' Dental Mechanics, Anatomy, Physiology; two years' Hospital Practice, Medicine, Surgery, and Dental Lectures (four years): 1st year, £56; 2nd year, £84; 3rd year, £64; 4th year, £32. Total, £236. Medical Men: Two years' Mechanics, and Dental Practice and Lectures: 1st year, £102 6*s.*; 2nd year, £70. Total, £172 6*s.* For a six years' course of medical and dental education comprising the whole of the dental curriculum and the curriculum for the M.R.C.S., L.R.C.P. diplomas: 1st year, £91; 2nd year, £70; 3rd year, £73; 4th year, £60; 5th year, £73; 6th year, £49; total, £416, in six instalments payable in advance.

Guy's Hospital.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: There is ample accommodation for ordinary extractions and anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrator, the dental house surgeon, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It has a floor space of over 6000 square feet, and affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type, for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. The members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by two demonstrators and five mechanics. Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge. Two Entrance Scholarships are awarded in September, a War Memorial Scholarship in Arts of the annual value of £40 for four years; and a Science Scholarship of the value of £40 per annum for not more than four years. Prizes of the aggregate value of £40 are awarded for general proficiency and for skill in Operative Dentistry. The Newland-Pedley Gold Medal for Operative Dentistry is also awarded annually. Dental students are eligible for admission to the Residential College and enjoy the privileges of students in the Medical School. Application should be made to the Dean of the Medical School.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses in addition to the Theatres, Laboratories and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Dental Metallurgy and Dental Prosthesis. A systematic course of instruction in Dental Prosthesis is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to fees and course of study advised apply to the Dean, Prof. William Wright, who will be glad to make arrangements for anyone wishing to see the Dental School and Medical College.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students, in conjunction with the Royal Dental Hospital, Leicester-square, for the study of dentistry, and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women.

PROVINCIAL.

Birmingham Dental Hospital, Great Charles-street.—Dean: Mr. W. T. Madin. The Dental Hospital was founded in 1858, and was recognised by the Royal College of Surgeons in 1880 for the teaching of Dental Students. Having an annual attendance of about 21,000 patients, it affords every advantage for students about to enter the profession to acquire a thorough practical knowledge, as required by the Medical Council. The present Hospital was opened on July 6th, 1905. It has accommodation for 50 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery. The operations performed annually average 41,000, including 9000 gold and other fillings, and many cases of crowns, bridges, porcelain inlays, and regulations. By arrangements with the Birmingham University and with the General and Queen's Hospitals the entire course of Lectures, Hospital Practice, &c., may be completed for an inclusive fee of £144 4*s.* 6*d.*, or including Mechanical Pupilage, £255 15*s.* 9*d.*, inclusive of Examination fees for L.D.S. Birm. The instruments and materials necessary for Hospital Practice cost about £45. The Composition Fee for the courses required for the L.D.S. of the University, or any of the Corporations alone, is £75, payable in two annual instalments at the commencement of the first and second years; that for the courses required for the L.D.S. and the Degree in Dentistry of the University is £93 15*s.*; that for the L.D.S. in combination with the M.R.C.S. and L.R.C.P. is £115; and that for the M.B., Ch.B., and B.D.S. is £120. All of these composition fees are payable in two annual instalments at the commencement of the first and second years. Each of these fees covers the cost of the courses given at the University for the qualifications indicated, but does not include fees for Hospital teaching, nor Pre-Dental year Chemistry and Physics. For two years' dental hospital practice the fee is £26 5*s.*, payable in two instalments of £13 2*s.* 6*d.* each at the commencement of the first and second (hospital) years respectively. For two years' mechanical pupilage, £111 11*s.* 3*d.*, which may be paid in two annual instalments of £65 12*s.* 6*d.* and £45 18*s.* 9*d.* respectively; mechanical pupils may join for a probationary period of one month, fee £6 11*s.* 3*d.*, which is deducted upon payment of the full amount. For general surgical hospital practice, lectures, and demonstrations: Surgery, two winters, £13 2*s.* 6*d.* One Entrance Scholarship is offered annually of the value of £37 10*s.* It is awarded to the student who, entering for the Dental Degree of the University in October, or having entered not earlier than the previous April, shall pass the best examination in the subjects studied during his apprenticeship. Candidates must be under the age of 21 years. Application for admission, together with a certificate of birth, must be sent to the Dean of the Medical Faculty, Mr. William F. Haslam, on or before Oct. 15th.

Leeds University School of Dentistry.—The School of Dentistry is adequately equipped to provide for the complete training of the dental student. The School forms a part of the Leeds School of Medicine, whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital at the General Infirmary. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time demonstrators give the instruction in clinical dental surgery and prosthetic dentistry, which is carried out under the supervision and direction of members of the Honorary Staff, two of whom are in attendance each day. Special facilities are provided for instruction in Orthodontia and Dental Radiography. Prizes are offered for competition to pupils and students in their respective years of study. Communications should be addressed to the Warden, School of Dentistry, The University, Leeds, from whom a prospectus may be obtained.

Dental Hospital of Manchester.—This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given in Dental Prosthetics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Surgery, Radiography, and Anæsthetics by specially appointed Clinical Teachers.

For the whole course of hospital instruction for the L.D.S. (including two years' mechanical training) the fee is £131 5*s.*, paid in instalments. For the two years' Operative Course only, £26 5*s.*, paid in two instalments. For the whole course of hospital instruction for the B.D.S. degree (including mechanical training), £168, paid in instalments. Additional practice in Dental Mechanics may be taken by pupils who have already received their mechanical training elsewhere, at a fee of £36 15*s.* for six months. All the courses of instruction are open to women students. Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.—This hospital is centrally situated (within five minutes of the various colleges, infirmary, and railway station); the rooms are well lighted and thoroughly equipped for carrying on the work. Dental surgeons and an anæsthetist attend each morning. A tutorial dental surgeon and a prosthetic tutor is also in attendance. The Composition Fee for the special Dental Lectures and Dental Hospital Practice is £60 4*s.* if paid in one sum, or £62 6*s.* if paid in two instalments of £31 3*s.* The Composition Fee for the Lectures at the Colleges of Medicine and Science is £57 10*s.*; in addition to this there is a library and an athletic fee. The fee for General Hospital Practice at the Royal Victoria Infirmary, Newcastle-upon-Tyne, is £23 2*s.* Medals and Certificates of Merit are granted to students showing certain standards of proficiency in the various classes at the Dental School. The prospectus of the Dental Hospital and School, containing full information, may be obtained from either Mr. J. T. Jameson, 12, Windsor-crescent, Newcastle-upon-Tyne, Dean, or Mr. James Coltman, 13, Ellison-place, Newcastle-upon-Tyne, Vice-Dean.

Devon and Exeter Dental Hospital, 24, Southernhay West, Exeter.—Established 1880.—The hospital is open on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays, and patients are admitted between the hours of 9.30 and 11 A.M. Students attend the practice of the hospital under the control of the medical officers. Honorary treasurer, Mr. J. M. Ackland; secretary, Mr. Albert G. Littlejohn.

SCOTLAND.

The Incorporated Edinburgh Dental Hospital and School.—The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. The cost of the hospital outfit of instruments is included in the Dental Hospital fee of £42. The minimum cost of classes and Diploma for the whole course of dental instruction amounts to £98 17*s.* Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The minimum cost of Professional Education, the Triple Qualification, and the Licence in Dental Surgery amounts to £172 10*s.* The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital, 158, Renfrew-street and 15, Dalhousie-street, Glasgow.—The School is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Pathology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, and Anæsthetics. A new Radiography department has been added. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extramural schools where special provision is made for Dental Students. Composition fee for two years' Hospital Practice and Lectures special to Dentistry, £50 on entry, or in two instalments of £31 10*s.* and £21. A new mechanical laboratory with bench accommodation for 60 pupils and fully equipped with the most modern appliances for teaching practical dental mechanics has recently been added. Fee for two years' tuition, £63, or in two instalments. Full information may be had on application to the Dean.

Glasgow Royal Infirmary (Dental Department).—Mr. W. R. Taylor attends at the Royal Infirmary at 9 A.M. on Wednesdays and other days as arranged. The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry with Metallurgy, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Clinical Surgery, six months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital.

IRELAND.

Incorporated Dental Hospital of Ireland, Lincoln-place, Dublin.—All Dental Students who have passed their First Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anæsthetics. Fees: Hospital Practice (each year), £18 18*s.*; Lectures, £5 5*s.* The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

K. V. Francis to be Surg. Lt.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. St. G. B. D. Gray (late R.N.V.R., temp.) to be Surg. Lt. on Permanent List.

ROYAL ARMY MEDICAL CORPS.

Maj. J. W. S. Seccombe retires on ret. pay.

The undermentioned Maj.-Gens., late R.A.M.C., are appointed Hon. Surgs. to The King: H. A. Hinge, C.B., C.M.G., D.S.O., vice Maj.-Gen. S. G. Moores, C.B., C.M.G., late R.A.M.C., retd., and C. E. Pollock, C.B., C.B.E., D.S.O., vice Lt.-Gen. Sir T. H. J. C. Goodwin, K.C.B., C.M.G., D.S.O., late R.A.M.C., retd.

ARMY RESERVE OF OFFICERS.

Col. E. H. Condon, late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Maj. A. H. Falkner relinquishes his commn. and retains the rank of Maj.

extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by two demonstrators and five mechanics. Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge. Two Entrance Scholarships are awarded in September, a War Memorial Scholarship in Arts of the annual value of £40 for four years; and a Science Scholarship of the value of £40 per annum for not more than four years. Prizes of the aggregate value of £40 are awarded for general proficiency and for skill in Operative Dentistry. The Newland-Pedley Gold Medal for Operative Dentistry is also awarded annually. Dental students are eligible for admission to the Residential College and enjoy the privileges of students in the Medical School. Application should be made to the Dean of the Medical School.

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London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students, in conjunction with the Royal Dental Hospital, Leicester-square, for the study of dentistry, and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women.

PROVINCIAL.

Birmingham Dental Hospital, Great Charles-street.—Dean: Mr. W. T. Madin. The Dental Hospital was founded in 1858, and was recognised by the Royal College of Surgeons in 1880 for the teaching of Dental Students. Having an annual attendance of about 21,000 patients, it affords every advantage for students about to enter the profession to acquire a thorough practical knowledge, as required by the Medical Council. The present Hospital was opened on July 6th, 1905. It has accommodation for 50 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery. The operations performed annually average 41,000, including 9000 gold and other fillings, and many cases of crowns, bridges, porcelain inlays, and regulations. By arrangements with the Birmingham University and with the General and Queen's Hospitals the entire course of Lectures, Hospital Practice, &c., may be completed for an inclusive fee of £144 4*s.* 6*d.*, or including Mechanical Pupilage, £255 15*s.* 9*d.*, inclusive of Examination fees for L.D.S. Birm. The instruments and materials necessary for Hospital Practice cost about £45. The Composition Fee for the courses required for the L.D.S. of the University, or any of the Corporations alone, is £75, payable in two annual instalments at the commencement of the first and second years; that for the courses required for the L.D.S. and the Degree in Dentistry of the University is £93 15*s.*; that for the L.D.S. in combination with the M.R.C.S. and L.R.C.P. is £115; and that for the M.B., Ch.B., and B.D.S. is £120. All of these composition fees are payable in two annual instalments at the commencement of the first and second years. Each of these fees covers the cost of the courses given at the University for the qualifications indicated, but does not include fees for Hospital teaching, nor Pre-Dental year Chemistry and Physics. For two years' dental hospital practice the fee is £26 5*s.*, payable in two instalments of £13 2*s.* 6*d.* each at the commencement of the first and second (hospital) years respectively. For two years' mechanical pupilage, £111 11*s.* 3*d.*, which may be paid in two annual instalments of £65 12*s.* 6*d.* and £45 18*s.* 9*d.* respectively; mechanical pupils may join for a probationary period of one month, fee £6 11*s.* 3*d.*, which is deducted upon payment of the full amount. For general surgical hospital practice, lectures, and demonstrations: Surgery, two winters, £13 2*s.* 6*d.* One Entrance Scholarship is offered annually of the value of £37 10*s.* It is awarded to the student who, entering for the Dental Degree of the University in October, or having entered not earlier than the previous April, shall pass the best examination in the subjects studied during his apprenticeship. Candidates must be under the age of 21 years. Application for admission, together with a certificate of birth, must be sent to the Dean of the Medical Faculty, Mr. William F. Haslam, on or before Oct. 15th.

Leeds University School of Dentistry.—The School of Dentistry is adequately equipped to provide for the complete training of the dental student. The School forms a part of the Leeds School of Medicine, whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital at the General Infirmary. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time demonstrators give the instruction in clinical dental surgery and prosthetic dentistry, which is carried out under the supervision and direction of members of the Honorary Staff, two of whom are in attendance each day. Special facilities are provided for instruction in Orthodontia and Dental Radiography. Prizes are offered for competition to pupils and students in their respective years of study. Communications should be addressed to the Warden, School of Dentistry, The University, Leeds, from whom a prospectus may be obtained.

Dental Hospital of Manchester.—This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given in Dental Prosthetics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Surgery, Radio-cut out on the score of economy. This, if it were the case, would, I think, be the strongest objection to the existing system.

The mental outlook in a laboratory where a good deal of teaching and research are going on should be wider and the methods more enterprising than in a laboratory solely or mainly devoted to routine, and to the extent that that is the case the municipal bacteriology should be more thoroughly done in a university laboratory. On the other hand, the weak points in a scheme, such as that existing at Leeds, are as you suggest: (1) That the time of the heads of the university department concerned may be too much absorbed with administrative duties, and (2) that the health of the city is not the first and only professional interest of the city bacteriologist. I believe, however, that the argument for and against an arrangement such as that existing in Leeds are more evenly balanced than you have supposed.

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I am, Sir, yours faithfully,
JAMES WALTER MCLEOD,
Professor of Bacteriology, University of Leeds.
Sept. 12th, 1923.

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To the Editor of THE LANCET.

SIR,—I notice that in THE LANCET of Sept. 15th you state that I have resigned my post at the above Bureau *to take up other important duties* (the italics are mine). The wording is unfortunate, as it might lead anyone to suppose that my resignation is due to the fact that I have obtained another position and am relinquishing my duties here on that account. Such is not the case, and I would ask you to be good enough to insert this explanation in your next issue. I realise that the words I have italicised may merely be the expression of a pious hope, a hope I devoutly share, but they are certainly liable to misinterpretation. Hence my request.

I am, Sir, yours faithfully,
Sept. 14th, 1923. ANDREW BALFOUR.

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To the Editor of THE LANCET.

SIR,—In your issue of Sept. 15th (p. 574) appears an annotation on a paper of Prof. Viton, under the heading "Lilliputian Tuberculin Dosage." At the end of the note you add: "Prof. Viton does not say whether he has or has not carried out control tests with a 0·25 per cent. solution of carbolic acid alone." It seems to me that a consideration of the figures given makes it clear that, at any rate with the higher dilutions, the effect can only be due to the carbolic acid.

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Any impurity of the original tuberculin, or any value for its molecular weight over 200 makes this dilution even greater.—I am, Sir, yours faithfully,
Manchester, Sept. 17th, 1923. E. N. ALLOTT.

Medical News.

LONDON HOSPITAL MEDICAL COLLEGE.—A lecture on the Treatment of Diabetes Mellitus with Insulin will be delivered by Dr. Otto F. F. Leyton on Oct. 15th, at 4.15 P.M., in the Anatomical Theatre of the College. The lecture is intended for senior students of the hospital and post-graduates.

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ROYAL SANITARY INSTITUTE.—A prospectus of the lectures and demonstrations to be delivered during the autumn term has been issued, and can be obtained from the offices, 90, Buckingham Palace-road, London, S.W. 1. An introductory lecture will be given to the students of the several courses by Prof. H. R. Kenwood, Deputy Chairman of the Council, on Monday, Sept. 24th, at 5.30 P.M., in the Institute. The sanitary officers' course comprises the subjects scheduled for the examination of the Institute and the Sanitary Inspectors' Examination Board. The practical training for meat and food inspectors includes the inspection of meat at a cattle market, with demonstrations on live cattle and sheep, slaughtering and dressing of animals, &c. The lectures for health visitors and child welfare workers are arranged as a preparation for the health visitors' examination of the Institute. This course is open to all students who wish to attend, but only those who hold the nursing and midwifery qualification recognised by the Board of Education can be admitted to the examination.

MAUDSLEY HOSPITAL.—A course of lectures and practical courses of instruction for a diploma in Psychological Medicine (Part II.) will be held at this hospital, Denmark Hill, London, S.E., during the session. Eight lectures on Morbid Psychology will be delivered by Dr. Edward Mapother on Mondays at 2.30 P.M. and 4.30 P.M., commencing Oct. 8th; eight lectures on the Psychoneuroses, by Dr. Bernard Hart, on Mondays at 3.30 P.M. and 5.30 P.M., commencing Nov. 5th; six lectures on the Pathology of Mental Diseases, including Brain Syphilis, its Symptomatology and Treatment, by Sir Frederick Mott, F.R.S., on Tuesdays at 4.30 P.M., commencing Nov. 6th; five lectures on the Legal Relationships of Insanity and Treatment, by Dr. C. Hubert Bond, on Oct. 9th, 11th, 16th, 23rd, and 25th, at 4.30 P.M.; eight lectures on the Practical Aspect of Mental Deficiency, by Dr. F. C. Shrubsall, on Wednesdays at 2.30 P.M., commencing Oct. 10th, and on Tuesdays at 2.30 P.M., commencing Nov. 6th; six lectures on Crime and Insanity, by Dr. W. C. Sullivan, on Wednesdays at 4.30 P.M., commencing Oct. 10th, and on Thursdays at 4.30 P.M., commencing Nov. 8th and 15th; six lectures in Clinical Psychiatry, by Dr. Mapother, on Wednesdays at 2.30 P.M., commencing on Nov. 7th; twelve Clinical Demonstrations in Neurology, by Sir Frederick Mott, and Dr. F. L. Golla, on Thursdays at 2.30 P.M., commencing Oct. 11th. The first six demonstrations will be given by Sir Frederick Mott at Camberwell Infirmary; the second six will be given by Dr. Golla at the Hospital for Paralysis and Epilepsy, Maida Vale, on Thursdays at 2.30 P.M., commencing Nov. 22nd. Inquiries as to lectures, &c., should be addressed to the Director of the Pathological Laboratory at the hospital.

TERRITORIAL ARMY RESERVE.

The following having attained the age limit are retired: Lt.-Cols. J. C. Renton and Sir S. J. Sharkey (and retain the rank of Lt.-Col.); Majs. J. J. Cox (retains the rank of Maj.), and G. R. Swinhoe (retains the rank of Maj. and is permitted to wear the prescribed uniform); Capt. J. C. McClure (retains the rank of Capt.).

Capts. A. T. Swan and J. C. Stewart relinquish their commns. and retain the rank of Capt.

ROYAL AIR FORCE.

Flight Lt. H. L. Burton is granted a permanent commission.

INDIAN MEDICAL SERVICE.

Capts. E. S. Goss, C. J. Stocker, A. W. Duncan, L. F. Brandenbourg, and E. A. Penny to be Majs.

DEATHS IN THE SERVICES.

Surgeon-Commander Alec Bedingfield Marsh, R.N., surgeon specialist at the Royal Naval Hospital, Haslar, in diseases of the ear, throat, and nose, died at the age of 46 on Sept. 7th. He was the son of the late Mr. Henry Marsh, Paymaster-in-Chief, R.N., graduated in arts at Oxford in 1899, and qualified with the L.R.C.P., L.R.C.S. Edin., and the L.R.F.P.S. Glasg. with honours in 1903. After serving as assistant medical officer at the County Asylum, Winwick, near Warrington, he joined the Royal Navy in 1904. He served with the Prince of Wales in H.M.S. *Hindustan* and with the Duke of York in H.M.S. *Collingwood* at the outbreak of the war, and was afterwards with the Royal Naval Air Wing at Grantham. During 1919 he served in connexion with the evacuation of Russian refugees on the Black Sea, developing lung trouble from which he never completely recovered. He leaves a widow and two young children.

Surgeon-Colonel William Thomas Martin, A.M.S., retired, died at Bournemouth on Sept. 15th in his eighty-second year. He was a graduate of the old Queen's University of Ireland, where he obtained the gold medal in 1859. He received his first commission in the Army in 1863 and served with the Abyssinian expedition of 1867 and was present at the capture of Magdala (mentioned in despatches and medal). He also served with the Burmese expedition of 1885-87 (medal with clasp). Surgeon-Colonel Martin retired in 1896.

Correspondence.

"*Audi alteram partem.*"

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

To the Editor of THE LANCET.

SIR,—The letter from Dr. Ernest Thomson in your issue of Sept. 1st seems to me to merit attention. The experience which I gained in teaching large numbers of undergraduates for many years has brought me to the opinion that Dr. Thomson is fundamentally right. Every effort should be made to limit the course to those parts of the subject which are of use to physicians and surgeons and practitioners as means of diagnosis. During all the years that I was teaching I endeavoured to give every student facilities for learning how to see the fundus oculi both by the direct and indirect methods, and generally availed myself of the help of a demonstrator to superintend the work in the dark-room.

No student should be allowed to qualify for registration on the Medical Register who cannot explore the fundus. I have known students who have been through an ophthalmic course without ever having had the opportunity of seeing an ophthalmoscope used. Some of them had seen pictures of the fundus in health and disease thrown on a screen by a projection lantern, but had never seen the ophthalmoscope used. Such a course should certainly not be recognised either for graduation or qualification. I also invariably laid special stress on the taking of fields of vision, the analysis of diplopia, the testing of the pupillary reflexes, and the estimation of visual acuteness. In other words, I did my best to make the students acquainted with those parts of ophthalmic study which may be helpful in localisation. In addition to this instruction, I always discussed in considerable detail iritis, corneal ulceration, interstitial keratitis, glaucoma, and cataract. I feel that nothing more should be attempted in the case of undergraduates. It seems to me that the above subjects are the essentially useful, and that the 20 meetings to which the qualifying course was by regulation supposed to extend—my own course always was one of 40 meetings—was too short to take in anything more than the above subjects, and even these could only be dealt with in an elementary fashion.

In Sir George Newman's lately published report there is a paragraph from which the casual reader might infer that the suggestion to teach the undergraduate the use of the ophthalmoscope is a new one, although, in fact, prominence has been given to that subject in almost every elementary course in the United Kingdom for the last 30 or 40 years. Undoubtedly there were, as I have already indicated, and possibly still are, a few courses in which no opportunity was, or is, given to the students to practise with the ophthalmoscope, but that has been for many years the exception. Personally, I think that instruction deficient in this respect should not be considered as qualifying. It is obvious that the consulting ophthalmic surgeon of a large general hospital should be in close contact both with the physicians and surgeons of the hospital. When the consulting ophthalmic surgeon takes his duties seriously such consultations may be of the greatest value; but I have known one large hospital which had a consulting ophthalmic surgeon who never gave a consultation, but always allowed the work to be done by an assistant, and occasionally by a very incompetent one.

In my own life-time that august body, the General Medical Council, has perpetrated at least two jokes: it ordained that physics should be taught in 50 meetings; it ordained that ophthalmology should be taught in 20.—I am, Sir, yours faithfully,

Glasgow, Sept. 17th, 1923. FREELAND FERGUS.

PATHOLOGICAL DEPARTMENTS.

To the Editor of THE LANCET.

SIR,—The leading article on this subject in your issue of Sept. 8th made special reference to the conditions which exist in Leeds. Since the matter has had some publicity, I desire to add to what has already been written in your columns on this subject.

You remark particularly on the fact that the posts of professor of bacteriology and city bacteriologist have been combined here. While admitting that economy has been a considerable factor in connexion with that arrangement, and that it is not in all respects an ideal one, I think it is desirable to state, in justice to those who have been responsible for this arrangement, that economy has not been the only advantage considered. An arrangement such as the existing one enables a university bacteriological laboratory to carry a considerably larger staff than would otherwise be possible, and amongst these the work is shared out. As a result the public health work of the city is carried out by a group of men who spend their time partly in teaching, partly in research, and partly on routine examinations, instead of being done by one or at most two men, who tend to be deluged with routine examinations. Where the appointment is entirely a municipal one, the city bacteriologist being on a fixed salary, there is a tendency to send specimens for examination without stint, and the bacteriologist may be forced to delegate his work unduly or to adopt rather precarious short cuts. On the other system of payments for specimens examined, there is likely to be a more discriminate demand for examinations, and as soon as there is a real and necessary increase in the work required the university is automatically enabled to increase the staff of its bacteriological department. Of course it might be argued that necessary examinations are cut out on the score of economy. This, if it were the case, would, I think, be the strongest objection to the existing system.

The mental outlook in a laboratory where a good deal of teaching and research are going on should be wider and the methods more enterprising than in a laboratory solely or mainly devoted to routine, and to the extent that that is the case the municipal bacteriology should be more thoroughly done in a university laboratory. On the other hand, the weak points in a scheme, such as that existing at Leeds, are as you suggest: (1) That the time of the heads of the university department concerned may be too much absorbed with administrative duties, and (2) that the health of the city is not the first and only professional interest of the city bacteriologist. I believe, however, that the argument for and against an arrangement such as that existing in Leeds are more evenly balanced than you have supposed.

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Radcliffe Infirmary, Oxford.—A post-graduate course will be held as usual this year in the week Oct. 1st–6th. There will be morning clinics and demonstrations, and in the afternoon two 1½ hour sessions. A detailed programme will be sent on application to Dr. W. T. Collier, 48, Woodstock-road, Oxford, or Dr. Hugh Whitelocke, 6, Banbury-road, Oxford, joint hon. secretaries.

Sociological Society.—A course of six lectures on the Bearing of Psycho-Analysis upon Sociological Problems will be held at Caxton Hall, Westminster, on consecutive Tuesdays, beginning Tuesday, Oct. 9th, at 8.30 P.M., when Dr. Ernest Jones will give an introductory lecture. Subsequent lectures, entitled "Man the Individual," "The Family," "Politics," "Education," "Vocation," will be given by Dr. James Glover, Mr. J. C. Flugel, Dr. M. D. Eder, Miss Barbara Low, and Miss E. Sharpe respectively. Applications for tickets should be made to the Secretary, Psycho-Analytical Lecture-Course, Leplay House, 65, Belgrave-road, Victoria, London, S.W. 1.

North-East London Clinical Society.—The programme for the session 1923–24 is as follows: On Oct. 4th, at 4.15 P.M., Dr. G. F. Still will give the opening lecture on Common Errors of Diagnosis in Diseases of Children. On the 11th the annual dinner will be held at The Prince of Wales's Hospital, Tottenham, at 8 P.M. for 8.15 P.M. On Nov. 7th Dr. F. H. Kyngdon on Early Experiences in Practice, followed by a discussion and exhibition of cases by members of the Society. On Dec. 6th Mr. E. M. Atkinson will read a paper on the Significance of Hæmaturia and its Investigation. On Jan. 2nd, 1924, Dr. T. Rushbrooke will give Reminiscences from General Practice; and on Feb. 7th Mr. W. Ibbotson will discuss the Relation of the Central Nervous System to the Ear, Nose, and Throat, in Health and Disease. On March 5th a paper will be read by Dr. F. J. Tresilian on Old Drugs and New; and on April 3rd one by Dr. L. R. Yealland on the Rôle of Neurology in General Practice. On May 7th Dr. H. C. Samuel will speak on Some Common Errors in the Diagnosis and Treatment of Diseases of the Skin, and on June 5th Mr. N. B. Fleming will discuss Ocular Manifestations of Disease Elsewhere. The meetings will be held at 4.15 P.M. at the Prince of Wales's Hospital, Tottenham.

Medical Society of London.—The syllabus of the first half of the session 1923–24 has now been issued. On Oct. 8th, at 8 P.M., the annual general meeting will be held, followed at 8.30 P.M. by an ordinary meeting, when Dr. Herbert Spencer will give his presidential address on Some Changes in Obstetric Practice since the Foundation of the Medical Society of London. On Oct. 22nd, at 8.30 P.M., there will be a clinical evening, with an exhibition of cases and radiograms. On Nov. 12th, at 8.30 P.M., a discussion on Constipation—its Causes, Results and Treatment from the General Practitioner's Point of View will be introduced by Dr. H. Des Vœux, followed by Dr. Walter Broadbent, Dr. Chittenden Bridges, Dr. D. M. Barcroft, Dr. W. W. Stocker, Dr. Edward Furber, Dr. Percy Spurgin, Dr. Moreland McCrea, and others. On Nov. 26th, at 8.30 P.M., a discussion on the Treatment of Acute Suppurative General Peritonitis will be introduced by Mr. Sampson Handley, followed by Mr. James Berry, Sir Cuthbert Wallace, Mr. Garnett Wright, Mr. H. Carson, Mr. R. P. Rowlands, Mr. V. Z. Cope, and others. On Dec. 10th, at 8.30 P.M., a discussion on Intracranial Hæmorrhage in New-born Children, its Pathology, Effects, Treatment, and Results, will be introduced by Mr. Eardley Holland and Dr. H. Charles Cameron, followed by Dr. Farquhar Buzzard, Mr. Laming Evans, Dr. Sidney Owen, Mr. H. A. T. Fairbank, Dr. J. B. Mennell, Dr. L. G. Phillips, and Dr. E. Bellis Clayton.—The Lettsomian lectures on the Treatment of Pulmonary Tuberculosis will be delivered in February and March, 1924, by Dr. R. A. Young, and the annual oration will be delivered in May, 1924, by Mr. Wilfred Trotter. The hon. secretaries for the year are Mr. T. P. Legg and Prof. F. Langmead; the house of the society is at 11, Chandos-street, Cavendish-square, W. 1.

Manchester's Public Health Committee.—The multifarious activities of the sanitary section are set forth in a report recently issued covering the period from April 1st, 1922, to March 31st, 1923. There are 28 sets of tables and 24 sections dealing with subjects ranging from complaints made by the medical officer of health, the police, and the public (the number of complaints of nuisance dealt with was 10,274), to inspection of drains, the abatement of nuisances of various kinds—dairies and milkshops, ice-cream manufacture (510 in number), public lavatories, workshops, canal boats, unhealthy dwellings, offensive trades, and adulteration of food and drugs. Houses let in lodgings or occupied by more than one family number 2403, to which 23,369 day and 302 night visits were made. The number of infectious cases dealt with by the inspectors was 7974. Four inspectors were specially employed to deal with the nuisance arising from the emission of black smoke, and 111 cases were reported where the emission had been two minutes or more in the half hour's observation. Sixty-seven cases were referred to the justices and in the remaining cases the offenders were cautioned. The bakehouses number 642, and of these 47 are situated in basement premises. As regards the adulteration of food and drugs the percentage of samples adulterated has increased from 2·95 last year to 3·40 this year. The highest percentage of adulteration (12·82 per cent.) seems to obtain in mineral waters, cordials, &c., followed by milk, 7·7. The inspector for carrying out the Canal Boats Acts inspected 1899 boats during the year. The number of insanitary dwellings certified was 55. An average of 442 lodgers per night were accommodated at the Municipal Lodging House for Men (cubicles 467) and 195 per night of women at Ashton House (cubicles 210).

Presentation to a Medical Man.—Dr. Adolph Bronner, who has been for 34 years honorary surgeon to the Royal Eye and Ear Hospital, Bradford, and whose father was one of the founders of the hospital, was presented on his retirement from the post, by the Lord Mayor, Alderman T. Snowden, in the Council Chamber on Sept. 13th, with two travelling bags and a gold cigarette case. A tablet recording Dr. Bronner's services has also been placed in the hospital. The surplus of the money subscribed was handed to Dr. Bronner, who expressed his intention of buying with it something useful for the institution with which he has been so long connected.

Financial Needs of Leeds Hospitals.—Owing to the fact that the Leeds Infirmary has a very heavy bank overdraft amounting to £54,500, and increasing at the rate of £60 a day, it has been determined to make a special appeal to the business establishments and trades of the city on behalf of the infirmary and the other three principal hospitals—the Hospital for Women and Children, Leeds Maternity Hospital, and the Public Dispensary. To this end the city has been divided into 20 areas, and every firm will be visited with a view to enlisting the financial aid of chiefs and staffs alike to liquidate the debt.

The late Dr. W. Case, J.P.—Dr. William Case, born at Aylsham, near Norwich, in 1863, died on July 30th at Durban after an operation. He had been Government District Surgeon at Harding, Alfred County, Natal, for 18 years. Educated at King's College Hospital, London, Dr. Case arrived in Natal in 1896. For a short period he undertook the duties of house surgeon at Grey's Hospital, Pietermaritzburg. He then became successively the Government District Surgeon at Eshowe, Zululand, Paulpietersburg, and finally at Harding, where he has practised since 1905. Dr. Case was a lover of sport, and was for three years president of the Alfred Company Agricultural Society. Much sympathy is felt for the widow and son, Mr. Leslie Case.

The late Dr. John McMurray.—The death of Dr. John McMurray took place at his residence at Bootle on Sept. 12th at the age of 66. After a distinguished medical career at Queen's College, Belfast, in the early 'eighties he took the M.Ch. and M.D. degrees of the Royal University of Ireland. He held several appointments as house surgeon and resident medical officer in institutions in Liverpool, and then settled in Bootle, where he was for a time honorary surgeon of the Bootle Borough Hospital. He was also a J.P. of the borough, and Mayor of Bootle in 1897–98. Dr. McMurray occupied a prominent position in the borough and served for years on the borough council; and his work as a medical man was mostly among the working classes with whom he was very popular for his kindly manner and his robust geniality. He was an enthusiastic Freemason, being P.M. of the Hamer Lodge in 1893.

Donations and Bequests.—By the will of the late Mr. R. Beck, of Swansea, the testator left, among other bequests, 3000 £1 5½ per cent. Cumulative Preference shares of Baldwins, Limited, to the Swansea General and Eye Hospital; 1000 such shares each to the Y.M.C.A., the Institution for the Blind, Swansea, and the Deaf and Dumb Institution; 500 each to the Discharged Prisoners' Aid Society, Swansea, and the Invalid Asylum, Stoke Newington, London, N. The residue of the estate, after certain family trusts have been made, will be divided into 100 parts—each roughly amounting to about £1000. This residue will be distributed among certain institutions, including 20 parts each to the Swansea University College and the Swansea General and Eye Hospital; 5 parts each to University College Hospital, London, Dr. Barnardo's Homes, and the National Benevolent Institution, London, E.; 3 parts to the Hospital for Women, Stoke Newington, London, N.; 2½ parts each to the Royal Wolverhampton Orphanage, the Glyn Vivian Blind Institution, the Royal National Life-boat Institution, and the Children's Home, Bonner-road, Victoria Park, London.—Under the will of the late Mr. J. P

Bauer, of Manchester, the following among other bequests are made: £1000 to the Manchester Royal Infirmary, to endow a bed to be called the "James Bauer bed"; £100 each to St. Mary's and South Hospital, and Ancoats Hospital and Dispensary; and £50 each to the Manchester Jewish United Sisters Maternity Society, and the Manchester Jewish Kosher Kitchen at the Manchester Royal Infirmary.—Mr. Thomas Frederic Harrison, shipowner, of Liverpool and Windermere, left £500 each to the Westmorland County Hospital, Kendal, Liverpool Royal Infirmary, Liverpool Northern Hospital, Liverpool Southern Hospital; and £250 each to the Stanley Hospital, Liverpool, and the Children's Infirmary, Liverpool.—The Manchester Children's Hospital during the past month received donations to the amount of £1550, including £1388 from the Hospital Sunday Fund.—As a result of the garden party held in July over £500 have been handed over to the Lord Mayor of Manchester's Two Million Shillings' Fund for the city hospitals.

MEASUREMENT OF PROGRESS IN PUBLIC HEALTH.—A lecture with this title will be delivered by Sir Arthur Newsholme on Oct. 4th, at 5 P.M., at the London School of Economics and Political Science, Houghton-street, Aldwych, W.C. 1.

UNIVERSITY COLLEGE HOSPITAL.—Past and present students of the hospital will hold their annual dinner on Friday, Oct. 5th, at the Hotel Cecil. Tickets (12s. 6d.) can be obtained from Mr. Gwynne Williams and Dr. T. R. Elliott at University College Hospital Medical School.

FATAL ACCIDENT TO GALWAY MEDICAL MAN.—Dr. George O'Kelly, of Mountbellew, County Galway, was recently killed in a motor accident. While he was driving in answer to a medical call, a dog ran under his car and the steering gear went out of order. The car mounted a ditch and overturned on Dr. O'Kelly, killing him instantaneously. He had been medical officer of Mountbellew for 13 years, and was held in high respect.

FOREIGN DECORATION.—The King has given Dr. James Ferguson Lees, C.B.E., Director-General of the Egyptian Public Health Administration, His Majesty's Royal licence and authority to wear the Insignia of Grand Officer of the Order of the Nile, which decoration has been conferred upon him by the King of Egypt.

DUBLIN LABOUR DISPUTE AND SUPPLY OF DRUGS.—An impasse has arisen in regard to the supply of drugs to the Dublin Union. It appears that the contractors, a Dublin firm of manufacturers, have some dispute with their employees, and are at present employing non-union labour. When they delivered a supply of drugs to the union, certain of the employees of the guardians refused to handle them, and the drugs had to be removed by the contractors' men. The representatives of labour requested the guardians to purchase their drugs from a firm employing only union labour, and suggested the name of a Liverpool firm. The guardians, however, have no power to purchase otherwise than from their contractor, and the contract does not terminate until Sept. 30th. The net result appears to be that the patients in the union hospital are deprived of medicines.

A LINK WITH FLORENCE NIGHTINGALE.—Mr. Alfred George Wilkinson, M.R.C.S., L.S.A., who qualified in 1857 and who died at Northampton on Sept. 14th in his eighty-ninth year, was a student at Birmingham when the Crimean War broke out. He volunteered for service and served principally at the Barrack Hospital at Scutari, attending the wounded after the charge of the Light Brigade at Balaclava. Mr. Wilkinson had been in practice at Northampton since 1870 and three years ago was presented with a testimonial by his fellow-townsmen. He had been attending patients up to a week before he died and was confined to his bed for only four days.

THE LATE DR. WILLIAM WHITE, J.P.—Dr. White died suddenly at Hadfield on August 31st at the age of 72. A native of Laxton, Notts, where his forbears had resided for over 200 years, Dr. White was educated at Newark-on-Trent and at Aberdeen University, where he graduated M.B., C.M. in 1876, and M.D. in 1878 with honours. Dr. White practised for a few years at Wooley Bridge and in 1884 settled at Hadfield, where he spent the remainder of his busy and useful life. In 1911 he was chosen an Alderman of the Borough of Glossop, then Mayor for the year 1912–13, and Deputy Mayor for nine subsequent years. His services were specially valuable in all matters connected with sanitation and health; besides holding other offices he had been a Justice of the Peace from 1897. Dr. White was much loved in the district in which he worked for 40 years and his memory will long be cherished. Both his sons studied medicine at the University of Manchester, Captain White being killed in the war, while Dr. Charles Francis White is assistant medical officer at the Port of Liverpool.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, Sept. 24th.—10 A.M., Mr. Maybury: Surgical Pathology. 12 noon, Mr. [illegible]: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.

TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. [illegible]: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Mr. Gibb: Eye Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. [illegible]: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-urinary Dept.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Banks-Davis: Nose, Throat, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 5 P.M. Saturdays, 10 A.M. to 1 P.M., Inpatients, Out-patients, Operations, Special Departments.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, POST-GRADUATE COURSE.

SATURDAY, Sept. 29th.—10–11 A.M., Dr. C. L. Fitzwilliams: Early Diagnosis of Cancer of the Breast. 12–1 P.M., Mr. S. Maynard Smith: Chronic Pain in the Right Side of the Abdomen. 2–3 P.M., Sir William Willcox: Chronic Rheumatic Toxaemia. 3–4 P.M., Dr. B. Miller: Demonstration of Cases of Cardiac Disease.

SUNDAY, Sept. 30th.—10.30 A.M., Dr. C. M. Wilson: Investigation of Dyspepsia. The Treatment of Diabetes.

MANCHESTER FRENCH HOSPITAL, 21, Acomb-street, Whitworth Park, Manchester.

THURSDAY, Oct. 4th.—4.30 P.M., Dr. N. C. Haring: The Spahlinger and other Methods of Serum Treatment in Pulmonary Tuberculosis.

Oct. 11th.—Dr. A. C. Magian: The Treatment of Painful Menstruation.

Oct. 18th.—Mr. R. R. Kerr: The Surgery of Injured Fingers.

Oct. 25th.—Dr. A. C. Magian: The Treatment of Irregular Menstruation.

Appointments.

ECCLES, H. A., M.D. Lond., has been appointed House Physician to the Royal Infirmary, Sunderland.

SANDILAND, E. L., M.B., B.S. Lond., D.P.H., Medical Superintendent to the East Lancashire Tuberculosis Colony, Barrowmore Hall, near Chester.

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth Infirmary, &c.—H.S. £200.

Benenden (Kent) National Sanatorium.—Res. Asst. M.O. £250.

Bromley and Sevenoaks Rural District Councils.—M.O.H. £1000.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Three Registrars.

Epsom, The Manor.—Jun. Asst. M.O. £132.

Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and Asst. Cas. O. £50.

Ipswich County Borough.—Sen. Asst. M.O.H., &c. £600.

Kingston-upon-Hull City and County.—R.M.O. £400.

Leicester City.—Asst. Tuberculosis O. £600.

London County Mental Hospital Service.—Seventh Asst. M.O. £432.

London Jewish Hospital, Stepney Green, E.—Hon. Asst. P., Hon. S. Also Asst. to Out-Patients. £100.

Manchester Northern Hospital for Women and Children.—Hon. S.

Manchester Royal Infirmary.—R.M.O. £200.

Newcastle-on-Tyne Dispensary.—Hon. Phys.

Newcastle-upon-Tyne City Hospital for Infectious Diseases.—Res. Med. Asst. £350.
Nottingham Education Committee.—Jun. Asst. Med. Insp. £500.
Oswestry, Shropshire Orthopædic Hospital.—Res. Surg. O. £500. Two H.S.'s. £250.
Plaistow Fever Hospital, Samson-street, E.—Sen. Asst. M.O. £430.
Prince of Wales's General Hospital, Tottenham, N.—H.S. £150. H.P. £150. Also Jun. H.S. and Jun. H.P. £110 each.
Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £100.
South London Hospital for Women, Clapham Common, S.W.—Temp. Asst. P.
South Mimms, Barnet, Clare Hall Hospital and Sanatorium.—Asst. M.O. £350.
Staffordshire General Infirmary, Stafford.—H.P. £150.
Walsall General Hospital.—Sen. H.S. and Jun. H.S. £200 and £150 respectively.
West Bromwich and District Hospital.—Res. Asst. H.S. £180.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. H.S.'s. £150 and £100 respectively.
Wolverhampton and Staffordshire Hospital.—Res. M.O. £150.
York City Mental Hospital, Fulford.—Asst. M.O. £500.

The Chief Inspector of Factories, Home Office, S.W., announces a vacant appointment at Mid-Calder, Edinburgh.

Births, Marriages, and Deaths.

BIRTHS.

BROSTER.—On Sept. 11th, at Winn-road, Southampton, the wife of L. R. Broster, M.Ch., F.R.C.S., of a daughter.

EASON.—On Sept. 11th, at the Superintendent's House, Guy's Hospital, the wife of H. L. Eason, C.B., C.M.G., M.D., of a daughter.

FORREST.—On Sept. 13th, at 10, Coates-crescent, Edinburgh, the wife of A. W. Forrest, M.A., M.D., D.P.H., Public Health Department, Wandsworth, of a daughter.

MCMORLAND.—On Sept. 13th, at Brookfield, Colyton, Devon, the wife of Dr. J. Bruce McMorland, of a daughter.

WALKER.—On Sept. 8th, at Kuliang, China, the wife of Dr. Ronald R. Walker, of a son.

MARRIAGES.

WORGER—GASKINS.—On August 20th, at The Church of The Sacred Heart, Burnham-on-Sea, William Worger, M.R.C.S., L.R.C.P., to Edith Gaskins, second daughter of A. A. A. Wotzel, Esq., O.B.E., of Belmont, Sutton, Surrey.

GOLDEN WEDDING.

LARKIN—WOOD.—On Sept. 17th, 1873, in the Choir of Saint Saviour's, Southwark (Southwark Cathedral), by the Revd. Samuel Benson, M.A., chaplain, assisted by the Revd. Daniel Moulin, B.A., rector of Holy Trinity, Trinity-square, S.E., Jane Maria, second daughter of the late William Wood, M.R.C.S. Eng. and L.S.A. Lond., of Trinity-square, S.E., to Frederick George Larkin, F.R.C.S. Eng., L.R.C.P. & L.M. Edin., of Trinity-square, S.E., and Grove Park, Kent, youngest son of the late Richard Larkin, of Maypole, Hoath, near Canterbury.

DEATHS.

FARNELL.—On Sept. 16th, suddenly, Henry Dawson Farnell, F.R.C.S., of Grasmere, Eastbourne, aged 71 years.

JACKSON.—On Sept. 14th, at the Freemasons Hospital, London, John Charles Jackson, late Medical Officer for Health of Fulham, in his 71st year.

MANNING.—On Sept. 12th, suddenly, in London, Joseph Vincent Manning, M.D., late of Bloemfontein, South Africa.

MARTIN.—On Sept. 15th, at Bournemouth, Surgeon-Colonel W. T. Martin, A.M.S., retd., in his 82nd year.

NORRIS.—On Sept. 9th, at Garmelow, Eccleshall, Edward Stacy Norris, M.A., M.B., late of Eton, aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LATE MR. H. D. FARNELL.—On Sept. 16th Eastbourne lost one of its oldest medical practitioners by the death of Dr. Henry Dawson Farnell. He had been in practice in the town since 1878, and was respected and esteemed by everyone with whom his work brought him in contact. Dr. Farnell was born at Salisbury 71 years ago. He studied medicine at University College, London, and became M.R.C.S. Eng. in 1874 and F.R.C.S. in 1885. For three years he was house surgeon at the Liverpool Northern Hospital, after which he settled at Eastbourne. He was one of the oldest members of the medical staff of the Princess Alice Memorial Hospital. In 1894 he was placed on the Commission of the Peace for the borough. During the war Dr. Farnell did much voluntary work at the local Red Cross Hospital, also at Summerdown Convalescent Camp, and was subsequently given the O.B.E. He married in 1881 Miss Mary Colgate, daughter of Mr. Robert Colgate, F.R.C.S., also of Eastbourne.

Notes, Comments, and Abstracts.

A MEDICAL STUDENT'S IMPRESSIONS OF SOME CONTINENTAL HOSPITALS AND THEIR METHODS.*

BY G. E. C. COLLIS.

A PARTY of some 17 senior medical students, representing universities in London, Edinburgh, Oxford, Manchester, Glasgow, Liverpool, and Leeds, undertook this autumn a three weeks' tour of the principal continental university towns. Our itinerary included Brussels, Leyden, Berlin, Dresden, Vienna, Prague, Munich, Zurich, and Paris; everywhere we were welcomed by local students and given facilities to inspect medical work. It might be of interest to record a few of the impressions we received, the points which in medical or surgical practice struck us as interesting, either because of their difference from or similarity to those in vogue in Great Britain. Of necessity such a tour precludes any detailed study of continental methods, but nevertheless a bird's-eye view can be gained of hospital accommodation and appliances, of the quantity and type of the clinical material, and most important of all, one meets the men who are working in these centres. Perhaps one's first observation is not the differences but the essential similarities which exist between British and foreign hospitals and medical men. The similarity of structure and routine of the former; of the type, mode of thought, and outlook of the latter.

Hospital Accommodation.

The hospitals visited varied from the new and as yet unoccupied premises of Leiden, which embody the accumulated experiences of European and American institutions, to the centuries old Salpêtrière in Paris, a transformed pre-revolutionary jail. The continental hospitals as a whole struck us as being much better supplied with gardens and surrounding parks than similar institutions in this country. There, however, the ward accommodation is much more restricted. In some places there is scarcely room to walk between the beds, and the centre of the floor is frequently occupied by beds back to back. Gymnasia containing mechanical appliances were very much in evidence in all the hospitals of German-speaking towns, especially Vienna, where there is a separate apparatus for both active and passive exercise of each group of muscles in the body.

A Treatment for Pelvic Exudates.

A form of treatment for pelvic exudates not in general use in this country was seen in Vienna. The patient is placed in the lithotomy position with the pelvis raised, and a rubber bag, resembling a small Champetier de Ribes's bag, containing 1 kgm. of metallic mercury, is inserted into the posterior fornix and left in position 10–15 minutes. Pressure of the bag combined with the respiratory movements of the patient give the effect of "internal massage." The treatment is repeated every two or three days. This mercury bag is also used to assist in the replacement of the retroverted uterus. The dorsal position is everywhere used for the examination of patients, the Sims very seldom.

In Leiden and Vienna we were shown the obstetric forceps designed by Kalen of Christiania. These superficially resemble the long curved forceps, differing in the shape of the blade. The advantages claimed are that they are easier to apply in high forceps deliveries and can always be applied to the biparietal diameter. In the maternity clinic in Vienna, the axis traction forceps have been abandoned in favour of this type for the past 12 months.

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* The tour of which the above impressions are recorded was arranged by the National Union of Students of Great Britain. This body exists to represent English and Welsh students both nationally and internationally, Scotland having a union of its own on similar lines, and is a member of the Confederation Internationale des Etudiants (C.I.E.) to which the national unions of some 20 European countries are affiliated. The C.I.E. is concerned with the interests of university students the world over, and through it the unions of the different countries are brought into permanent contact. This facilitates the work of arranging a welcome for students going to study at foreign universities, as well as holiday tours, correspondence exchanges, &c. As an example of what is done the English National Union has this year arranged—in addition to the medical tour of Europe described above—tours of agricultural students to Denmark, of engineering students to Czecho-Slovakia, and general holiday visits to France, Belgium, Germany and Hungary. In every case the English party, which contained both men and women students, has been conducted and entirely looked after by students of the country visited. This has not only enabled them to meet and get to know foreign students, but has resulted in making the tours very cheap. Results have been uniformly successful.

Hydrotherapy and Heliotherapy in Vienna.

We visited the institute for Continuous Hydrotherapy. This form of treatment is employed in all cases of generalised dermatitis, especially salvarsan dermatitis, for neurological cases with bed sores and contractures, septic cases—e.g., fungating carcinoma of the rectum and appendix abscess. One of this last type of case had been in the bath continuously for 18 months. In the same building we saw the Wagner-Jauregg malaria-salvarsan treatment for syphilis.

Heliotherapy for pulmonary tuberculosis in children was seen in the department of pediatrics. The main roof of the building is asphalted, and a wooden roof about 6 feet wide placed round two sides. Under this roof are the cots. The children are kept out throughout the year, although in Vienna there may be 20 degrees of frost in winter.

The radiographic installations in all the places visited were of the most modern type, especially those of Zurich. In taking a radiogram, instead of conforming the tube to the patient as is usual elsewhere, the patient is here conformed to the tube. This is effected by means of an apparatus similar in principle to the operating table, the head, limbs, &c., being capable of being elevated or lowered.

We were interested to note the wider employment on the continent of local anæsthesia in surgery than is customary in Britain. General anæsthetics are administered by the "closed" method by means of elaborate instruments.

Paris was visited on our return journey, but we were unable to take the fullest advantage of the opportunities offered us there. Time pressed, and, moreover, our powers of observation had become somewhat exhausted, as our tour had proved a strenuous though thoroughly enjoyable one.

Methods of Teaching.

With regard to methods of teaching in medicine, we noticed one important difference between Central Europe on the one hand and France and Britain on the other. In German-speaking countries and in Holland much stress is laid on the laboratory, while in France, as in England, greater attention is paid to the clinical aspects of medicine. To the visitor it is the well-equipped and organised laboratories which appeal most strikingly. Where the system of teaching is largely clinical, there is little to impress the eye, and on a hurried visit it is impossible to form a correct estimate of its scope. The value of each method of teaching can only be proved by ultimate results, nor is this the occasion to discuss that side of the subject. The question of language is one which need not deter the intending student from Britain. Cliniques and lectures are given in English in many of the schools, and particularly in Vienna, where there are at present many Americans, is English largely used. There is an arrangement between some of the American and continental universities whereby assistants are exchanged for periods of 12 months. We met some of these American assistants in Zurich and Paris.

The chief value of such a tour for medical students lies in the appreciation gained of a wider medical horizon than can be seen from the viewpoint of one particular school. It is of especial service to the senior student or newly qualified man in showing where and on what lines he might pursue his post-graduate studies.

PUBLIC HEALTH IN BIHAR AND ORISSA.[1]

ACCORDING to the census of 1921 the population of this province was found to be 34,002,189, not including the tributary States of Orissa, in which vital occurrences are not recorded. The birth-rate was 34·6 per 1000, as compared with 32·2 in 1920, and 30·4 in 1919, showing a further recovery from the conditions prevailing in 1918–20, that were due to the epidemic of influenza, high prices, and food scarcity; though considerably below the decennial average of 39·2. In the several districts the ratio varied from 26·9 in Purnea and in Singhbhum to 40·2 in Angul and 40·7 in Monghyr. In the rural areas the ratio was 34·8, ranging from 26·8 in Darbhanga and 26·9 in Singhbhum to 40·2 in Angul and 40·8 in Monghyr; and in the towns 29·3, ranging from 13·6 in Balasore and in Dhanbad, to 41·3 in Jamalpur, 42·1 in Hajipur, and 45·3 in Sahibganj. The general death-rate was 32·8, as compared with 30·9 in 1920, 40·0 in 1919, and 35·6, the decennial average. In the districts of Gaya and Shahabad the ratios were 53·5 and 53·4 respectively, in Darbhanga and in Santal Parganas 23·7, and in Purnea only 21·6. In the towns the variations were extreme: at Lalganj the mortality was 64·7, at Katihar 7·2 per 1000. The infantile mortality, 159·0 per 1000 births, was some improvement on the corresponding rate (169·5) in 1920. The general death-rate among Hindus, who form the bulk of the population (28,161,118) was 33·5; among Mohammedans 28·0, and among Christians 19·7 per 1000.

Cholera showed a considerable increase from 0·7 deaths per 1000 in 1920 to 2·6 in 1921, this figure being also the average for the decennium (1911–20). In one district only (Angul, population 182,574) was there no death from this cause. The incidence was highest in Gaya rural district, where there were 27,119 fatal cases (13·0 per 1000), the adjoining Patna district, with 17,810 deaths (12·9) being similarly affected. Lieut.-Colonel W. C. Ross, I.M.S., Director of Public Health, who submits this report, is "strongly of opinion that the epidemic prevalence of cholera is largely associated with the prevalence of flies, and that good conservancy and the rapid removal of excreta (in which flies lay their eggs and breed) are fully as important measures for the prevention of cholera as the provision of pure water-supplies, and that both these preventive measures should be widely adopted if cholera is to be prevented as an epidemic disease." Such measures must be decentralised and carried out locally by the district boards and municipalities. The conditions most favourable for fly-breeding appear to be a mean temperature of about 85° and a humidity over 70 per cent. Heavy rainfall saved the situation early in August, and cholera immediately began to abate. The total cholera deaths amounted to 90,688, of which 29,710 occurred in July and 38,508 in August; in September they fell to 6721. Small-pox showed considerable improvement, 0·2 deaths per 1000, compared with 0·6 in 1920; in Palamau district the mortality was 0·0, and in Patna 0·8; in Angul district there was not a single death from this disease. The report states that "vaccination is the best, and the only real, means of prevention of small-pox; there is no doubt but that the cost of vaccination work is a splendid and profitable investment of public funds. . . . It would therefore appear to be wise and proper to organise the work more effectively, and to make vaccination compulsory and free, in order to get the whole population protected, and thus abolish a disease which is, of all diseases, the most easily and cheaply preventable." This is without doubt the proper course to pursue, and it is to be hoped that the executive authorities will support the Director of Public Health in the manner indicated.

The fever statistics (22·6 deaths per 1000, compared with 22·0 in 1920, and a decennial average of 23·3) varied in the rural districts from a mortality of 12·0 in Puri to 37·5 in Shahabad; and in the towns from 5·5 in Katihar to 30·7 in Gaya. During 1920 and 1921, 83,266 children were examined for enlarged spleen; the percentage found was 11·58. In the three districts of Muzaffarpur, Darbhanga, and Monghyr the ratios were found to be 0·56, 0·56, and 0·50 respectively, while in Singhbhum, Angul, and Balasore the ratios were 56·02, 65·55, and 68·29. "The prevention of malaria and hookworm constitutes the most important, and at the same time the most difficult, problem in the public health administration of the province." Colonel Ross considers that it is not practicable to prevent malaria, or reduce it permanently or on a large scale, by quinine; non-productive operations, such as draining, levelling, oiling of water surfaces, &c., are not feasible on a large scale over an enormous area. "What is wanted is a policy of malarial prevention which will pay its own way. . . . Such a policy is being carried out in Italy and Spain; it consists in combining agricultural improvement with sanitation, by draining or flooding marshes and wet lands in a scientific manner, so as to produce larger crops, and at the same time reduce the breeding of mosquitos." The Government of Bengal is now moving in this direction, and a similar action is suggested in Bihar and Orissa. The expense, of course, would be great, but the return would undoubtedly be remunerative.

The plague death-rate was 0·4 per 1000, compared with 0·5 in 1920 and 1·2 the decennial average. The districts of Patna (1·6 deaths per 1000), Saran (1·3), and Darbhanga (1·1) were most affected; Orissa division was entirely free. The towns, with a mortality ratio of 1·5 per 1000, suffered more than the rural districts (0·4). "The only preventive measure of real practical value is evacuation, which is now carried out by the people themselves in the majority of places." But "the better and permanent way would be to make the houses so that the rats were compelled to leave." With regard to respiratory diseases, from which the mortality was 0·2 per 1000, the same as in the preceding year, and in the decennium, it is stated that the toxin of influenza precipitates an attack of acute malaria in the many patients who harbour the malarial parasite, leading to a complicating pneumonia, which often proves fatal; quinine should therefore be given to prevent this complication. Dysentery and diarrhœa caused a death-rate of 0·8 in the rural districts and 1·6 in the towns; in the former, Puri and Cuttack districts suffered most with ratios of 5·3 and 5·0 respectively; in the towns, Puri (8·5), Jajpur (5·8), and Sambalpur (5·8). This prevalence is attributed chiefly to the bad state of the water-supply in Orissa division. In regard to hookworm disease (from which it has been found that approximately two-thirds of the population of Bengal are suffering, as well as large numbers in the districts of the United Provinces adjoining Bihar), investigations have been carried out at the Patna Lunatic Asylum, in several jails, and on a large scale among the mining population of Jharia; from 50 to over 70 per cent. of those examined have been found to be affected. Local conditions of overcrowding and general filth, as happens in the temporary collection of large numbers of coolies in construction works, lead to the spread of the disease. Its prevention "is very largely an economic question, and, unless it is considered and attacked from that point of view, little or nothing can be done to deal with it." In a subsequent section of the report (para. 54) Colonel Ross emphasises the point that "Public Health is purchaseable, and the people will only obtain the quantity and quality for which they are prepared to pay. . . . In other words, public health is fundamentally an economic question." The three essential factors are economic progress, education of the people, and legislation. "The greatest is the need for economic progress. . . . The wherewithal must be provided, otherwise the work cannot be done." This may be admitted; but, on the other hand, it must also be acknowledged that a population living under insanitary conditions cannot be healthy, and therefore cannot perform the work, or produce the results that would be obtained by a similar population living under healthy conditions; and it has been established over and over again that expenditure on sanitary works, properly carried out, justifies itself in the most decisive manner, and to the fullest extent.

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[1] Patna, Superintendent, Government Printing, 1922.

(*To be continued.*)

THE NATURE AND USE OF THE AIR.

FEW stories in the history of science are more romantic than that of the discovery of the nature and use of the air. Its importance to chemistry, physics, and physiology is inestimable, and it is pleasing to think that several of our own countrymen have taken a conspicuous place in this important phase of the history of science. The modesty of Boyle, the genius of Mayow, the careful thoroughness of Black and Hales, and the patience of Priestley, misguided phlogistonian though he was, are lessons not easily forgotten. Miss C. M. Taylor has well summarised the subject in a little book entitled "The Discovery of the Nature of the Air, and of Its Changes during Breathing" (London: G. Bell and Sons, Ltd. 1923. Pp. 84. 1s. 6*d.*), a really excellent little volume which should have an instant success.

POLISHED RICE AND BERI-BERI.

DR. F. E. Wood, in the medical report (1922) of the Federated Malay States, makes some interesting observations on the effects of increased consumption of polished rice among the Chinese and Malay population. It appears that since polished rice is now more easily obtainable than it was two or three years ago, the Chinese are reverting to it in preference to undermilled rice. The Malay natives are following their example, since the polished rice is both cheaper and more attractive than the more wholesome variety. As a result, beri-beri has greatly increased in the last two years. During the war the incidence of beri-beri was particularly low as, Dr. Wood states, owing to the shortage and control of rice, the Chinese were driven to employ other foodstuffs. Steps are being taken to warn the people of the dangers of polished rice as compared with undermilled or parboiled rice. Extract of rice polishings made by the Institute for Medical Research at Kuala Lumpur is now freely used in the treatment of beri-beri cases. It is especially useful in acute cases and undoubtedly tends to shorten the course of the disease.

VACCINATION IN THE N.W.F. PROVINCE, INDIA.

Lieut.-Col. W. M. Anderson, Director of Public Health in the North-Western Frontier Province, in his report for the year 1922–23, comments on the satisfactory increase in the number of vaccinations. The total number of operations (vaccinations and re-vaccinations) performed in the settled districts and agencies during the year amounted to 144,155, compared with 100,219 in 1921–22, thus showing an increase of 43,936; of this total 11,505 appear to have been unsuccessful. The successful primary vaccinations were at the rate of 40·31 per mille, the average for the preceding four years being 36·98. This is also a great improvement in the numbers of re-vaccinations. The incidence of small-pox has fallen concurrently; during the past quinquennium the average annual number of deaths was 805 and the mortality per 1000 of the population was 0·37. During the year under report there were 118 deaths from small-pox, giving a ratio of 0·05 per 1000 of population. Colonel Anderson states that vaccination is gradually becoming more popular among the rural population and resistance to primary vaccination is not offered. The glycerinated chloroform lymph used was procured from the Punjab Vaccine Institute throughout the year.

A HYGIENIC BREAST-PUMP.

WE have received a specimen of the Aspirateur Tourtier (9, rue du Regard, Paris), which is a breast-pump made entirely of glass and rubber, easy to manipulate and sterilise. Suction is produced by simple withdrawal of a piston, and the pressure can be released at any moment by removing an indiarubber stopper. The invention, it is stated, has been adopted at a number of the principal maternities in Paris, and it may be of service in the case of weaklings where neither mother nor nurse can carry out the hand-expression which is the usual practice in this country. It may also prove of use for women who are obliged to go out to work and for the purpose of obtaining breast milk from a wet-nurse for other babies, as is now practised widely in America and has recently been tried with success at the Manchester Children's Hospital. The price of the apparatus is given as 10*s.*, and it can be obtained in this country through the Sole Agent, Tourtiers Aspirators, 70, Victoria-street, London. S.W.1.

LONDON DOCTORS AND DENTAL SURGEONS,

1923–24.

THIS new directory, by reason of its size, its red cover and its style of printing calls to mind the Dentists' Register issued under the direction of the Dental Board. It is, however, a complete list of legally qualified (registered) physicians and surgeons and of graduates and licentiates in dental surgery, practising in Greater London, including Bromley, Croydon, Ilford, Kingston, Richmond, Surbiton, and Woodford. The General Medical Council has officially advised the publishers that this work conforms to its requirements, and the directory actually includes all additions to the Medical and Dental Registers up to May 31st last. The information given in the 300 pages is allocated under the following five headings: (1) Name, chief professional qualifications, and date of registration (with partnerships, if any); (2) addresses, telephone numbers, consulting and visiting hours; (3) description of practice; (4) nature of work; (5) chief hospital or public medical appointment, (*a*) present, (*b*) late. The matter is neatly and attractively set out and we have noticed few errors for a new work of this scope. The name, however, of one well-known surgeon lacks a vowel. An avowed purpose of the volume is to bring the profession and public into closer contact, and while being of service to the practitioner, at the same time to render the profession more accessible to the laity who, without being confused by a burden of detail, may rapidly find the data they seek. The Grafton Publishing Co. (Chichester House, Chancery-lane, W.C. 2) proposes to issue the directory annually. The price is 15*s.* 0*d.*

Messrs. W. and G. Foyle, Ltd. (booksellers, 121-125, Charing Cross-road, London, W.C.) have sent us a new catalogue of Department No. 9, containing recent and secondhand books on medicine, surgery, nursing, and pharmacy. The list is classified into general and special subjects and contains books both new and old, some of the latter now being not readily obtainable. The list should prove useful to that large circle of medical students who would like to read more than they can afford to buy at published prices.

W. J. H. D.—There are several institutes interested in any new suggestions for the treatment for cancer—e.g., the Cancer Hospital (Free), Fulham-road, London, S.W. 3, the Middlesex Hospital (Cancer Research Laboratories), London, W. 1, the Imperial Cancer Research Fund, 8–11, Queen-square, Bloomsbury, London, W.C. 1. The remarkable find might be submitted to one or other of these.

Messrs. Baillière, Tindall and Cox (8, Henrietta-street, London, W.C.) have issued a list of Works on Dentistry, published and sold by them, containing the names of more than 100 books and journals classified under subject headings. In each case the date of publication is given.

Corrigendum.—Dr. H. B. McCaskie informs us that the remarks on antenatal precepts attributed to him in our report of the Section of Obstetrics, B.M.A. (THE LANCET, Sept. 15th, p. 562) were not made by him. He holds exactly opposite views on the subject of antenatal examination.

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Detailed records were kept of the times at which the various reactions occurred, and in many cases the observations were continued over a period of nearly a year.

TABLE IV.—*Soft X Rays upon the Skin: Time in Days for Various Reactions.*

Time of exposure in minutes.	Epilation.		Blistering.	Healing.	Re-growth of hair.
	Partial.	Complete.			
21 [2]*	18†	—	—	—	61
28 [2]	19–24†	—	—	—	63–80
34 [10]	15–26	33 (1 only)	17 (1 only)	—	40–110
42 [2]	4–11	11–14	11–14	148	148
50 [8]	7–18	14–20	12–20	26–146	42 (1 only)

TABLE V.—*Hard X Rays upon the Skin: Time in Days for Various Reactions.*

30 [2]	40–46‡	—	—	—	—
40 [4]	18–29‡	—	—	—	—
50 [4]	14–23‡	—	—	—	—
75 [2]	59‖	—	—	—	—
90 [4]	11–29	—	—	—	—
100 [4]	21–22	33–36 (13)	—	—	52–59
125 [2]	18	30	—	—	45
150 [2]	20	24	20‡	24–30	36

* Figures in brackets denote number of rats.
† Nearly complete. ‡ Very slight. ‖ Other very slight.

The times of exposure to the "soft" rays ranged from 21–50 minutes and to the "hard" rays from 30–150 minutes, and it was found that a practically identical degree of reaction was obtained in the skin of the rats when the absorbed dose of "hard" X rays was six times that of the "soft"; this number may therefore be taken as a measure of the differential action of the two sets of wave-lengths. If we use the term "therapeutic factor" it is seen that a considerable difference is found for skin and for tumour. In several cases where the general degree of reaction of the skin to "hard" and "soft" rays was about the same (produced, however, by widely different doses) there still seemed some small difference in the nature of the reaction. With the "hard" X rays the onset of the reaction was slower, and the condition of the hair many months later was nearer the normal.

DISCUSSION OF RESULTS.

If the method by which comparison is made of the amounts of energy liberated in the tissues by the two beams of X rays under consideration is a valid one, then the results show that when equal amounts of X ray energy are absorbed from beams of different wave-lengths by animal tissues, the reactions of these tissues may differ considerably in degree and possibly to some extent in nature.

The conclusions reached have some bearing in radiotherapy. The experiments show that a bigger differential effect between "hard" and "soft" X rays exists for the skin of the rat than for the tumour cells. Provided this also holds for the human subject it is one argument for the use of very hard X rays or γ rays when tumours at a considerable depth below the skin have to be irradiated. The conclusion would perhaps be just the reverse in superficial conditions not involving the irradiation of normal skin.

The result also raises the question whether the specification which has been adopted by Seitz and Wintz[4] for expressing the carcinoma dose in terms of the skin dose is sufficiently rigorous, for this may be a function of the wave-length.

The two main results obtained are that about six times as much short wave-length energy as long wave-length energy must be expended in a lay
in order to produce equal reactions and
factor falls to about 2·6 in the case of th

We may question whether these are not cases in which the molecular configuration, apart from the atomic, is more affected by electrons of low than of high velocity. The experiments of C. T. R. Wilson[3] have produced direct evidence of the part which the electrons liberated in the track of a beam of X rays play in ionisation, and it would not be irrational to suppose that the slower electrons which would be released by the longer wave-length can give rise to more pronounced effects in the tissues than the quicker ones liberated by the shorter wave-length, even though a similar expenditure of energy occurs in the two cases.

TRAUMATIC INTESTINAL RUPTURE.

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INTESTINAL rupture, without penetration of the abdominal wall, sometimes referred to as subcutaneous rupture, is not an accident of common occurrence. The 34 cases upon which this report is based were collected from the records of Guy's Hospital between the years 1899 and 1923, a comparatively long period.

Situation of Rupture.

Stomach	4	
Duodenum	3	
Duodeno-jejunal junction	1	26
Jejunum	14	
Ileum	8	
"Small intestine"	3	
Cæcum	1	

The majority of ruptures clearly occur in the small intestine, and the comparative immunity of the stomach, the duodenum, and the colon is striking. Regarding rupture of the small intestine, the jejunum was more commonly injured than the ileum, and of the 14 jejunal lesions 7 were found within 18 inches of the duodeno-jejunal junction, an occurrence which cannot be entirely explained by chance. Other writers have found that whereas the jejunum is commonly injured in its first 3 feet, the ileum is commonly injured in its last 3 feet. Unfortunately, of the ruptures of the ileum in this series the exact situation was only mentioned in three cases. In two of these it was 4 feet from the ileo-cæcal valve, and in the third 2 feet from the valve.

It is difficult to account for the frequency of lesions in the upper part of the jejunum without supposing that the small intestine, in its upper part at any rate, bears some more or less constant relationship to the vertebral column, against which it is crushed by the force applied to the abdominal wall. Mall[1] has stated that the six primary loops of small intestine occupy definite positions within the abdominal cavity, while Grégoire[2] and many other anatomists believe that this is also true of the intestine in its final state of development. It is certainly very suggestive that it is the second or third loop of the jejunum which is commonly injured at the point at which it crosses the vertebral column.

Character of the Lesion.

Of the ruptures of the duodenum, two showed complete transverse division, and all were associated with other severe injuries in the upper abdomen. In the small intestine the majority of the lesions were partial ruptures—that is, the continuity of the bowel was not completely divided, although all its coats were involved. Of the nine cases of complete transverse division, seven were in the jejunum and two were in the ileum.

It is noteworthy that, whereas all the cases of rupture of the stomach and the duodenum were complicated by other injuries, usually intra-abdominal,

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[4] Seitz and Wintz: Die Rön[illegible] therapie (1

[3] Wil[illegible] ., Soc., A. vol., p. 85 (1911).

TABLE I.—THIRTY-FOUR CASES OF TRAUMATIC INTESTINAL RUPTURE.

No.	Age and sex.	Dates of (a) accident, (b) admission, (c) discharge or death.	Nature of injury.	Symptoms and signs.	Treatment.	Result.	Condition found at operation or post mortem.
1	8 F	(a) 11/8/02 (b) 11/8/02 (c) 11/8/02	Run over by light van.	Abdomen rigid. Liver dullness absent. Right and left flank distended.	No operation.	D*	Rupture of stomach and upper pole of spleen. Peritonitis.
2	8 M	(a) 26/4/10 (b) 26/4/10 (c) 26/4/10	Run over by cart.	Abdomen rigid on left side. Pt. vomited blood. Pulse 120.	Laparotomy 17 hrs. after admission.	D	Rupture of stomach and pancreas. Large quantity of free blood in abdomen.
3	6 F	(a) 28/5/10 (b) 28/5/10 (c) 28/5/10	Run over by motor-car.	Abdomen rigid in epigastrium. Much pain and vomiting. Rigidity increased. Pulse rose to 120.	Laparotomy 2 hrs. after injury. Rupture sutured.	D	Rupture of stomach near cardia; 4 to 5 oz. of blood-stained fluid in abdomen.
4	7 M	(a) 28/6/20 (b) 28/6/20 (c) 2/7/20	Knock on back of head by motor-van.		No operation.	D	Fracture of base of skull. Rupture of lesser curvature of stomach.
5	5 M	(a) 24/12/02 (b) 24/12/02 (c) 24/12/02	Run over by hansom cab.	"Signs of abdominal injuries."	Operation refused.	D	Rupture of duodenum. Fracture of femur.
6	14 M	(a) 3/6/10 (b) 3/6/10 (c) 4/6/10	Run over by cart.	Much abdominal pain. Little bruising.	Laparotomy. Suture of duodenum.	D	Duodenum completely severed intraperitoneally. Fracture of spine.
7	5 M	(a) 28/9/22 (c) 28/9/22	Run over by light van.	Pt. greatly shocked. Band of bruising across epigastrium. Abdomen rigid and tender. Liver dullness at first normal, later diminished.	No operation.	D	Complete rupture of duodenum. Liver and spleen lacerated. Fracture of many ribs.
8	20 M	(a) 24/3/17 (c) 26/5/17	Crushed between pole of wagon and post.	Abdomen extremely rigid and distended; extreme pain; pulse 72; no bruising.	Laparotomy. Suture of rupture. No drainage.	R	Partial rupture at duodeno-jejunal junction.
9	9 M	(a) 6/2/02 (b) 6/2/02 (c) 7/2/02	Run over by van.	Much collapse; vomiting; pulse feeble.	Laparotomy. Suture of rupture.	D	Partial rupture of jejunum 13 in. from the duodeno-jejunal junction.
10	50 M	(a) 3/8/03 (b) 3/8/03 (c) 3/8/03	Playing with lad of 16, who accidentally sat on his abdomen.	No immediate pain. Later pt. vomited. Pulse 140. Dullness developed in left flank.	Operation refused.	D	Partial rupture of jejunum in two places, 4 ft. and 9 ft. from pylorus. Peritonitis.
11	33 M	(a) 13/9/05 (c) 14/9/05	Struck in abdomen by crane.	Much pain. Pulse 76, on following morning 108.	Laparotomy on following morning. Suture.	D	Partial rupture of jejunum just beyond its commencement. Laceration of pancreas.
12	27 M	(a) 29/9/05 (b) 29/9/05 (c) 30/9/05	Fall of 50 ft. from telegraph pole. Struck right lumbar region.	Abdomen rigid. Liver dullness normal. Pulse 96. Three hours later much distension and marked pallor. Bruise of right iliac crest.	Laparotomy 5 hrs. after admission. Suture and ligature of mesentery.	D	Partial rupture of jejunum. About 1 in. away mesentery of bowel completely separated from its attachment for 4 in. Several branches of sup. mesenteric artery bleeding furiously.
13	29 M	(a) 1/5/08 (b) 2/5/08 (c) 6/6/08	Kicked by horse.	Vomited at once and throughout the following night. Much pain. Rigidity.	Laparotomy. Suture, irrigation, No drainage.	R	Partial rupture of jejunum about 5 in. from duodeno-jejunal junction.
14	9 M	(a) 23/2/10 8 A.M. (b) 23/2/10 2 P.M. (c) 8/4/10	Crushed between two carts.	Abdomen rigid and tender. Pulse rose, 130.	Laparotomy 14½ hrs. after. Suture, drainage.	R	Partial rupture of jejunum about 18 inches from duodeno-jejunal junction.
15	21 M	(a) 30/12/15 9 P.M. (b) 31/12/15 5.30 P.M. (c) 5/2/16	Run into by barrow.	Walked to hospital. Slight bruise on abdomen which was tender and rigid. Pulse 132.	Laparotomy. Suture, drainage.	R	Partial rupture of the first part of jejunum. Much brownish fluid in abdomen.
16	30 M	(a) 25/5/99 (b) 25/5/99 (c) 27/7/99	Crushed between pole and wall.	Acute pain. Abdomen retracted and immobile.	Laparotomy 2¼ hrs. after injury. Anastomosis with Murphy's button.	R	Complete rupture of the jejunum.
17	50 M	(a) 22/5/01 (b) 22/5/01 (c) 23/5/01	Hit on abdomen by piece of marble weighing 15 cwt.	Extreme pain, which later disappeared. Much shock. Rigidity.	Laparotomy 7 hrs. after injury. Murphy button anastomosis.	D	,, ,,
18	47 M	(a) 29/6/04 (b) 29/6/04 (c) 30/6/04	Crushed between two barges.	Very collapsed. Much pain. Abdomen rigid. Left side dull. Pulse 100.	No operation.	D	Complete rupture of jejunum. Rupture of pancreas. Fat necrosis. Peritonitis.
19	18 F	(a) 6/5/08 (b) 6/5/08 (c) 7/5/08	Run over by heavy cart.	Much shock. Pulse 116. Swelling of left side of abdomen due to percussion.	Laparotomy. Murphy button anatomosis.	D	Complete rupture of jejunum near commencement. Much blood in abdomen.
20	23 F	(a) 26/8/12 (b) 26/8/12 (c) 27/8/12	Run over by motor-bus.	Much abdominal pain. Vomiting.	Laparotomy immediate. Rupture not found.	D	Complete rupture jejunum. Laceration of omentum and mesentery.
21	12 M	(a) 20/10/22 (b) 20/10/22 (c) 20/10/22	Run over by lorry.	Extreme shock. Abdomen rigid and tender. Vomited a good deal of blood.	No operation.	D	Complete rupture of jejunum. Laceration of liver and pancreas.
22	29 M	(a) 12/2/23 (b) 12/2/23 (c) 14/2/23	Crushed between cart and wall.	On admission diffuse pain, no rigidity. Pulse 100. After 24 hours it rose to 120, with signs of peritonitis.	Laparotomy. Enterostomy.	D	Complete rupture of jejunum. Peritonitis and fat necrosis.
23	? M	(a) 8/9/99 (b) 8/9/99 (c) 9/9/99	Run over by trolley.	Much pain, rigidity; liver dullness normal. On following day pulse rose to 142. Dullness developed in lower abdomen.	Laparotomy. Suture.	D	Partial rupture of ileum. Much free blood in abdomen.

one also refused operation, and of the remaining seven 2 recovered. There does not appear to be, therefore, any great difference in the mortality of ruptures of the jejunum and ileum respectively, although it might have been supposed that the contents of the latter are usually more septic, and peritonitis therefore earlier in its appearance. In all the successful cases, with the exception of one where Murphy's button was used, it will be noticed that simple suture of the rupture was the only surgical procedure necessary. In the three cases where resection was undertaken the patient died. In only one case was enterostomy performed, and in this case also the patient died.

Table II.

Case No.	Situation of rupture.	Nature of operation.	When performed.
8	Duodeno-jejunal junction.	Suture of rupture. No drainage.	Not recorded.
13	Jejunum, 5 in. from commencement.	,, ,,	" Following day."
14	Jejunum, 18 in. from commencement.	Suture of rupture. Drainage.	15 hours after injury.
15	Jejunum, high up.	,, ,,	Not stated; at least 21 hours after injury.
16	Jejunum completely severed.	Murphy button anastomosis.	2¾ hours after injury.
25	Ileum, in 2 places.	Suture of each rupture and drainage.	Following day.
28	,, ,,	,, ,,	Not stated. 2 hours after admission.

Note.—By drainage is meant drainage of the peritoneal cavity.

In the successful cases the time factor, so highly significant in the perforation of a gastric or duodenal ulcer, does not appear to be of so great importance, for although in one case operation was undertaken within two and three-quarter hours of the injury, in one case it was delayed 15 hours, and in another at least 21 hours, while in a further two cases the abdomen was not explored until the following day. Regarding rupture of the small intestine as a whole, of a total of 26 cases the continuity of the bowel was completely severed in 9. Of these one refused operation and of the remainder only one recovered. Of the 17 cases in which the continuity of the bowel was only partially divided, one again refused operation, but of the remainder six recovered. It is clear, therefore, that the mortality of the second group is considerably less than that of the first, and since peritonitis does not seem to have been more marked in one than in the other, it is reasonable to assume that the shock associated with the more severe injury is very largely responsible for this disproportion.

The shock always associated with intestinal rupture, if at all severe, tends to become worse as time goes on, and offers almost insuperable difficulty in the treatment of these cases. In extreme cases the patient dies, even after an early and otherwise successful operation, while in its less severe degrees it obscures the whole clinical picture and masks the onset of peritonitis. A mortality of 78 per cent. is certainly enormous, and there can be little doubt that early exploration of the abdomen would reduce this to a considerable extent. At the same time, however, while every attempt in this direction should be made, it is doubtful whether in the present state of our knowledge a large percentage of recoveries can ever be attained.

I am much indebted to the members of the surgical staff of the hospital for their kind permission to publish these cases.

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A CASE OF COMPLETE DECEREBRATE RIGIDITY IN MAN,

WITH OBSERVATIONS ON VARIOUS REFLEX REACTIONS.

By F. M. R. WALSHE, M.D., F.R.C.P. Lond.,
NEUROLOGIST IN THE MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL, AND ASSISTANT PHYSICIAN TO THE NATIONAL HOSPITAL, QUEEN-SQUARE, LONDON.

In a recent paper[11] the writer discussed the question of Sherrington's decerebrate rigidity from the point of view of its occurrence and recognition in the human subject, and expressed the conclusion that while in the spasticity of hemiplegia and of the extended form of paraplegia we have a clear example of muscular hypertonus physiologically identical with that observed in the decerebrate animal, yet, so far, clinical neurological records contain no completely satisfactory account of a case of "decerebrate man." For the most part the cases to which this diagnosis has been attached during the past two years are examples of different varieties of extra-pyramidal syndrome, or of tonic fits, none of which conditions can rightly be identified with Sherrington's decerebrate rigidity.

In these circumstances it may be of interest to place on record the following case, which is a closer approximation to the experimentally produced condition in question than any the writer has encountered in the human subject. Not only was the hypertonus physiologically identical with that described by Sherrington, but there were present Magnus and de Kleijn's tonic neck reflex and also a form of interaction between tonic and phasic reflexes, both of which are a normal accompaniment of the rigidity in animals. Further, the clinical picture was free from complication by those irregularities of respiratory and cardiac activity and by tonic fits, which are in all probability due to gross disturbances in the blood-supply of the brain stem, and are no part of true decerebrate rigidity.

The patient was an unmarried woman of 23. She was admitted to hospital complaining of blindness of sudden onset seven days previously. Up to the morning on which she awoke to find herself deprived of vision she had been at her usual work, but she stated that during the year preceding she had suffered from occasional "bilious attacks with headache," which she had not regarded seriously.

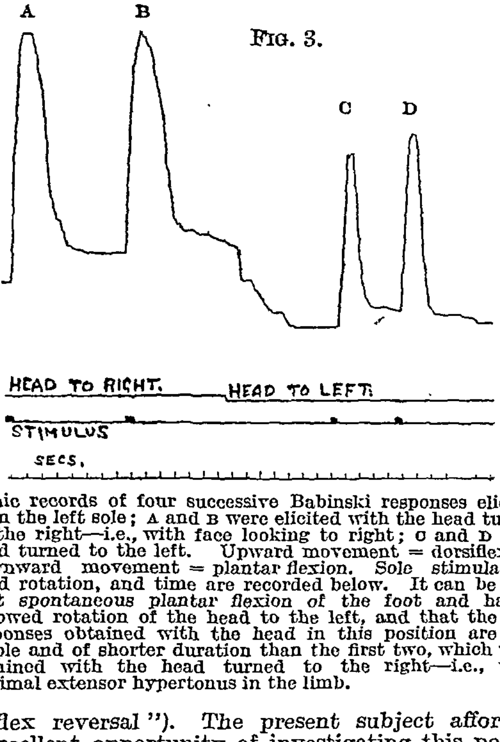
Condition on Examination.—The patient was alert, with normal intelligence, emotional tone, speech, development, and physique. There was total blindness in both eyes, no perception of light remaining in either; the discs showed intense papillœdema with commencing secondary atrophy, and the pupils were dilated and inactive, the cranial nerves being otherwise normal. The motor and sensory systems were normal. The tendon-jerks were brisk and equal on the two sides, the abdominal reflexes sluggish on both sides, and there was a bilateral extensor plantar response.

Operation.—A right-sided temporal decompression was performed, revealing a great increase of intracranial tension, but no other abnormality. A week later she was noted to have a well-marked left hemiplegia, with commencing flexor spasticity in the arm. There was considerable bulging of the scalp over the bone defect.

Course of Case.—During the second week after operation she gradually lapsed into a state of semi-coma, in which she could neither answer questions nor carry out simple orders. However, there was ample motor response of the right limbs to such stimuli as pinching or pin-prick. She remained thus for about two weeks, towards the end of which a right hemiplegia began to develop. Finally, in the fourth week complete double hemiplegia obtained. The patient lay motionless in bed. She was unable to swallow and was nourished by means of œsophageal feeds. The temperature was consistently below normal, ranging from 96° F. in the morning to 97° in the evening. The pulse was regular in force and frequency and averaged 84 per minute. Respiration was regular and unembarrassed and of a rhythm of 18. The blood pressure ranged between 130 and 140 mm. of mercury. During the last week of life the coma deepened, the tonic reflexes to be described failed, the rigidity waned, the tendon-jerks disappeared, and tonic fits, cardiac and respiratory irregularities developed. The blood pressure slowly sank during the terminal stage.

reflex, but as soon as active flexion ceased the limb returns to extension by an active “ extensor rebound.” Further, following the momentary inhibition, extensor tone may be increased in intensity (“ post-inhibitory exaltation ”). Clearly the force of the rebound and the degree of exaltation will depend upon the intensity of extensor tone originally present, and under different grades of extensor tone the flexion reflex may be expected to show different characters in respect of amplitude and time relations. This is simply an expression of that interaction of tonic and phasic reflex which is a normal element in coördination. Now, in Magnus and de Kleijn’s tonic neck reflex we have a method of varying the degree of extensor hypertonus at will from moment to moment, and therefore the form of the flexion reflex may be modified by head rotation. Indeed, Graham Brown[3] has found that in the decerebrate animal the active modification of the posture of the reacting limb may cause a complete reversal of the form of a reflex movement (“ reflex reversal ”). The present subject afforded an excellent opportunity of investigating this point, and since, as is now widely accepted, the Babinski plantar response is simply the dorsiflexion component of the *flexion reflex of the lower limb of man*, it may be used as an index of modifications in the flexion reflex.[12]

FIG. 3.



Graphic records of four successive Babinski responses elicited from the left sole; A and B were elicited with the head turned to the right—i.e., with face looking to right; C and D with head turned to the left. Upward movement = dorsiflexion, downward movement = plantar flexion. Sole stimulation, head rotation, and time are recorded below. It can be seen that spontaneous plantar flexion of the foot and hallux followed rotation of the head to the left, and that the two responses obtained with the head in this position are less ample and of shorter duration than the first two, which were obtained with the head turned to the right—i.e., with minimal extensor hypertonus in the limb.

Accordingly the present subject showed a marked change in the plantar response when the head was rotated from one lateral position to the other. Thus when the head was rotated so that the face pointed to the right shoulder, stimulation of the left sole evoked an ample Babinski plantar response with dorsiflexion of the foot and some flexion at hip and knee. The return or extension (*plantar flexion*) phase of the response was slower than the active flexion (dorsiflexion) phase and was incomplete. If the head was then rotated so that the face pointed to the left shoulder, the foot plantar flexed. The plantar responses subsequently elicited were less ample than those just described and the return, or extension phase, was rapid and complete. In these circumstances the extensor spasticity of the limb was maximal, and “extensor rebound” cut short the flexion reflex and rapidly restored the initial posture of the limb. Similar examples of this phenomenon have been described by the writer elsewhere, and apart from their obvious practical interest they have a great theoretical importance. These variations in the plantar response are graphically recorded in Fig. 3.

(b) *State of Failing Reflex Activity and of Tonic Fits.*

During the last five or six days of the patient’s life the condition we have described gave place gradually to a progressive failure of reflex activity and to deepening coma. The temperature began to swing from 96° in the morning to 101° in the evening. The pulse and respiration rates became rapid and variable. The blood pressure sank below 100. The Magnus and de Kleijn reflexes failed completely five days before death and the rigidity waned, but never entirely disappeared in the arms, which retained the posture described. The tendon-jerks disappeared and the flexion reflex on stimulation of the soles diminished in amplitude and force. Twice during the last days of the stage we have described as that of decerebrate rigidity the patient was noticed suddenly to become extremely rigid in her customary posture, and to become very red in the face. These attacks were of momentary duration. During the last week, however, they became of great frequency and intensity. The respiratory muscles became fixed, and the limbs were so rigid that no tendon reflexes could be elicited. These attacks lasted for from 15 to 20 seconds and passed off as suddenly as they developed, the patient sinking down into the bed. In the more severe ones the head retracted forcibly. A very large number of these tonic fits were noted, and doubtless many more escaped observation. They ceased entirely during the last 24 hours of life, when the patient was obviously moribund.

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A close examination of this case history reveals but two points of defect from the complete picture of decerebrate rigidity as seen in the experimental animal. The first of these is the flexion posture of the upper limbs, the second the retention of temperature control. In earlier papers[9] the possible explanation of the flexed position of the upper limbs in hemiplegia has been discussed. It may be traced to the fact that in man the forelimbs are no longer simple locomotor props and have taken on new and highly complex functions under the influence of the cerebral cortex. In consequence we should not expect them to take up the extensor attitude of standing. Secondly, the animal after transection of the brain stem in the region of pons or medulla loses all temperature control, and, as Bazett and Penfield have shown,[2] this fact is the chief obstacle to keeping the decerebrate preparation alive for more than a few hours. It is clear, therefore, that our patient was not completely “ decerebrate,” and that to this fact we owe our opportunity of observing over so long a period a clinical picture identical in every other essential with experimentally produced decerebrate rigidity.

With the various theoretical considerations arising out of the presence of Magnus and de Kleijn’s tonic reflexes, and of the interaction between these and the flexion reflex of the lower limb, it is not proposed to deal here, for they are discussed fully elsewhere.[10, 12] Tonic labyrinthine reflexes were not sought for, since the handling of the patient which their investigation involves was not thought desirable.

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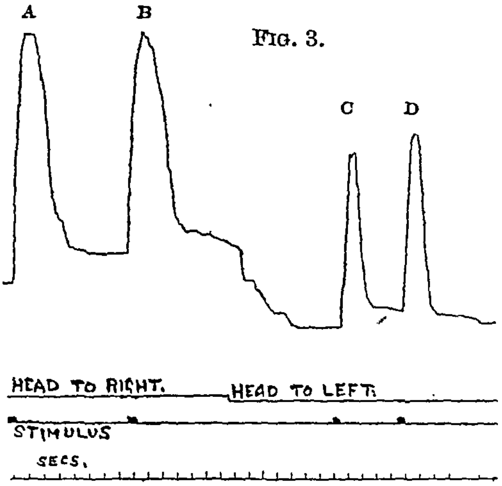

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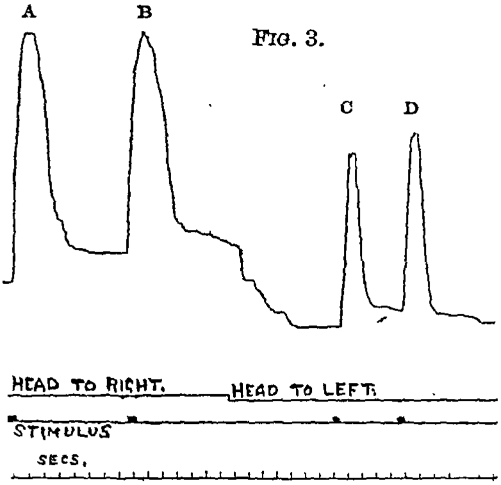

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Table I. gives a comparative description of a typical rat kept on diet 3143 for four weeks, and of one on the same diet plus a daily minimal protective dose (3·3 mg.) of cod-liver oil. The most definite and most reliable criterion for the final diagnosis was the histology, but the gross appearance and chemical analysis of the bones were of material aid in deciding the end-point in the titration of the substances. The microscopical investigation often demonstrated pathology not recognisable macroscopically, so that what appeared doubtfully positive protection in the gross always turned out definitely negative upon histological examination.

TABLE I.

Control rats on diet 3143 for four weeks. Severe rickets.	Rats on diet 3143 for four weeks that received daily a minimal protective dose of cod-liver oil. No rickets.
Macroscopical.	
1. Deformed chest.	1. Chest full and rounded.
2. Enlarged costo-chondral junctions and epiphyses.	2. No enlargement of costo-chondral junctions or epiphyses.
3. Very indistinct, disorganised costo-chondral line.	3. Costo-chondral lines straight and distinct.
4. Fractures of bony portion of ribs.	4. No fractures.
5. Bones very pliable.	5. Bones very much firmer than those of control, but more brittle than normal.
Microscopical.	
1. Deformity of rib near costo-chondral junction.	1. No deformity.
2. Very great proliferation of zone of provisional calcification. (25–50 layers of hypertrophic cartilage cells.)	2. Zone of provisional calcification consisting of 3–7 layers of hypertrophic cartilage cells.
3. No calcium deposit in zone of provisional calcification.	3. Moderate to very good deposit of calcium in zone of provisional calcification.
4. Disorganisation of zone of provisional calcification.	4. No disorganisation of zone of provisional calcification.
5. Wide rachitic metaphysis consisting mainly of osteoid and of uncalcified cartilage.	5. No rachitic metaphysis. Trabeculæ thin and short, but straight and well calcified.
6. Very great increase of endosteal and periosteal osteoid of cortex.	6. Only the physiological amount of cortical osteoid.
7. Callus of fracture consisting mainly of osteoid, uncalcified cartilage, and fibrous bone-marrow.	7. No fracture.
Calcium Content of Bones.	
Average % wet, 4·39.	Average % wet, 6·77.
Average % dry, 11·43.	Average % dry, 14·81.

Including the number used for the preliminary tests 208 rats were used in this part of the investigation. For economy of space the protocols of the rats will not be included in this report. The rats were put on the rickets-producing diet at the age of from 25 to 28 days and weighing about 40 g. Two sets of controls were used in the titration of every oil: one set receiving the rickets-producing diet alone, the other the same diet supplemented by a daily dose of the crude oil known to protect against the development of rickets. The first titration of the potency of an oil was made by using quantities within wide limits—viz., 2·25 mg., 22·5 mg., and 225·0 mg. daily. If one of these doses gave protection, then the final value was determined by titrating with quantities at close intervals between the first positive result and the negative one immediately below it. In the case of the growth-promoting experiments four animals were employed for every dose, and the minimal quantity was arrived at by a similar spacing of doses.

The final values given in Table II. for the minimal anti-rachitic and growth-promoting doses of the various oils represent in every case the mean between the first definitely positive result in the final titration and the negative one immediately below it, both of which are also given in the table.

The chart compares the potency of the above oils by giving the number of minimal growth-promoting and rickets-protecting doses per gramme of every oil. It shows very well that although the initial potency of the crude oil was somewhat greater for growth-promotion than for protection against rickets, yet the growth-promoting function suffered more rapidly from oxidation at 120° C. than did the anti-rachitic function. In the specimen removed after 18 hours of heating and aeration the growth-promoting function was practically destroyed, while the anti-rachitic power was still retained in a moderate degree. In the 24-hour specimen of oxidised cod-liver oil neither function could be detected.

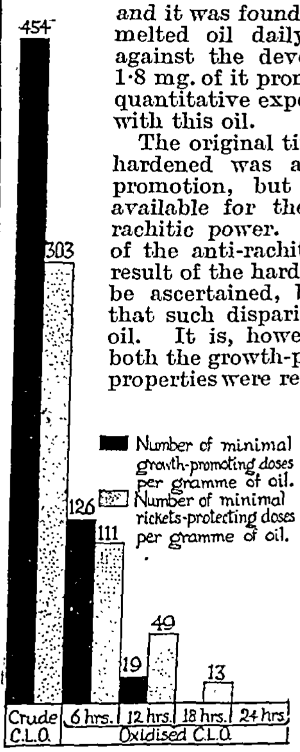
TABLE II.

Type of oil.	Anti-rachitic function.			Growth-promoting function.		
	Dose which just failed to protect.	Dose which gave definite protection.	Calculated minimal protective dose.	Dose which just failed to promote growth.	Dose which promoted definite growth.	Calculated minimal growth-promoting dose.
	Mg.	Mg.	Mg.	Mg.	Mg.	Mg.
Crude cod-liver oil	2·2	4·5	3·3	1·9	2·5	2·2
or Oxidised cod-liver oil—						
6 hours	6·7	11·2	9·0	6·7	9·0	7·9
12 „	18·0	22·5	20·2	45·0	56·2	50·6
18 „	67·5	90·0	78·7	450·0*	—	—
24 „	450·0*	—	—	1000·0*	—	—

* Indicates that this dose definitely failed, and that a larger dose was not tested.

For additional information a sample of hardened cod-liver oil was also tested for the two functions, and it was found that about 33·7 mg. of the melted oil daily were potent to protect against the development of rickets, while 1·8 mg. of it promoted growth. An elaborate quantitative experiment was not performed with this oil.

The original titre of the oil before it was hardened was also 1·8 mg. for growth-promotion, but no specimen of it was available for the estimation of the anti-rachitic power. How much deterioration of the anti-rachitic potency occurred as a result of the hardening could not, therefore, be ascertained, but it is hardly possible that such disparity existed in the original oil. It is, however, very significant that both the growth-promoting and anti-rachitic properties were retained in a high degree by the hardened oil.



2. *The Growth-Promoting and Anti-rachitic Functions in Spinach.*—Spinach was used as the plant source of the organic factor. The fresh leaves were ground to a paste and administered in quantities from 0·1 g. to 3·0 g. daily to rats that had stopped growing on the fat-soluble deficient diet and to rats on the rickets-producing diet No. 3143. The daily dose of spinach was mixed with a small quantity of the diet and served first. When that was consumed the rat was allowed to have the rest of the ration. The minimal growth-promoting dose was found to be between 0·1 and 0·25 g., while even 3·0 g. daily, the maximum dose which it was found practicable to administer (about 30 per cent. of the diet), did not have the slightest effect in

promoting calcium deposition. The animals that received the spinach were as severely rachitic as the controls. This result is similar to that of McClendon,[10] who found that from 0·1 to 0·5 g. of dried spinach cured ophthalmia, while it showed no evidence of affording protection against the development of rickets even when it formed as much as 75 per cent. of the daily diet. Zucker[11] also showed that an alcoholic and ether extract of spinach, while it possessed the power to promote growth, was unable to protect against the development of rickets.

Summary.

1. The growth-promoting and anti-rachitic properties of cod-liver oil are inactivated at different rates by heat in the presence of air.

2. There is a very great disparity between the growth-promoting and the anti-rachitic potency of spinach.

3. A certain sample of hardened cod-liver oil has been found to possess high growth-promoting and anti-rachitic activity.

4. The above observations give further support to the hypothesis of McCollum, Simmonds, Shipley, and Park that the anti-rachitic and the fat-soluble A factors are different principles.

To Prof. C. J. Martin we give our sincere thanks for very helpful advice and criticism during this investigation. A part of the expenses of this research was defrayed from a grant made by the Medical Research Council, to whom our thanks are also due.

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PRENATAL CARE AND PUERPERAL MORTALITY.*

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THE remarkable fact that there has been no appreciable reduction in the maternal mortality of childbirth during the last 50 years is capable of two possible explanations: either obstetric medicine has made no progress or the modern advances are not in general use. The first suggestion is obviously untrue, for no one can doubt that valuable additions have been made to the treatment of the disorders and complications of pregnancy and the conduct of difficult labour, and it can easily be shown that these advances are competent to reduce the puerperal mortality if and when they are properly employed. But it has not yet been realised that modern methods are essentially preventive methods, and that to be successful they must be initiated during the prenatal period. Thus, the early prophylaxis of the toxæmias, contracted pelvis, and puerperal sepsis gives almost uniformly good results, whereas the latter continue to be disappointing if treatment is delayed until the disease or mechanical difficulty has reached an advanced stage.

But it is absurd to argue that modern methods have failed because the mortality is still high in cases of convulsive eclampsia, ruptured uterus, or puerperal septicæmia; on the contrary, such dangerous complications are almost impossible if prenatal care is exercised, and therefore the development of such advanced lesions is per se strongly suggestive of the neglect of modern methods. Some degree of failure to recognise and treat warning prodromata is inevitable so long as midwives continue to supervise from 50 to 75 per cent. of all pregnancies, and while the general public remain indifferent, if not hostile, to routine prenatal work; but the very inadequate training of medical students and the exigencies and established usages of general practice are also responsible factors.

As a direct consequence the general practitioner is commonly compelled to undertake the treatment of obstetric difficulties in emergency without adequate assistance and often under grossly unsuitable conditions; or the case is admitted to hospital after unsuccessful interference at home, sometimes in extremis, or at least under circumstances highly "suspect" and dangerous, and which, in spite of the resources of hospital technique and equipment, may completely discount the value of otherwise safe and effective treatment.

Attention has already been drawn to the subject in a report on Maternal Mortality published by the Local Government Board in 1915. After an exhaustive inquiry the following conclusions were expressed:—

> (1) The majority of deaths are caused by puerperal fever, hæmorrhage, and convulsions, most cases of which are well within the range of preventive medicine.
>
> (2) Local differences in total mortality are in the main caused by differences in availability of skilled assistance when needed during pregnancy and at and after childbirth.
>
> (3) Puerperal fever has been substantially eliminated from lying-in hospitals, but otherwise there is a remarkable uniformity in its distribution.

Papers on this subject have usually been written from the hospital standpoint, and fail to recognise, and therefore neglect, the totally different and much more difficult conditions of general practice. Many suggested remedies are impracticable because they cannot be applied to the majority of cases. Admittedly it is impossible to produce uniformity of skill and technique, just as it is unnecessary to provide so-called surgical surroundings for ordinary uncomplicated labour; but it is neither unreasonable nor impracticable to demand that abnormal pregnancy and complicated labour should be diagnosed as quickly and treated as carefully as other major surgical emergencies. Prenatal care is the only method of attaining this object, and fortunately a simple one, for its elementary principles are not beyond the powers of the average midwife, and its teaching can be applied as easily in general as in hospital practice; and not until this method is universally adopted can any serious reduction of the puerperal mortality be effected. To support this contention it is necessary to demonstrate three groups of facts: (1) the causes of death in childbirth; (2) the extent to which these morbid processes are associated with recognisable warning symptoms during pregnancy; (3) the proof that such prodromata are largely amenable to preventive treatment.

Causes of Maternal Death in Childbirth.

At Brownlow Hill Infirmary, Liverpool, since 1880 there have been 159 deaths amongst 14,000 cases delivered in the maternity wards. The causes of death were generally determined by autopsy, and may be classified as follows:—

Puerperal Sepsis (53).—Septicæmia, 18; septicæmia and syphilis, 6; septicæmia and gonorrhœa, 1; peritonitis, 16; septic pneumonia, 5; erysipelas, 2; cellulitis, 1; phlebitis, 1; salpingitis, 2; pyelitis, 1. (*a*) Most of these labours were instrumental or otherwise complicated. (*b*) Patients belonged to the lower strata of society and showed a high incidence of venereal infection. (*c*) Modern control of sepsis in hospital is shown by the following figures : 1880–90, 30 deaths ; 1890–1900, 13 deaths ; 1900–10, 7 deaths : 1910–20, 3 deaths. (*d*) The many different types of fatal sepsis shown emphasises the importance of honesty in diagnosis and suggests that if accurate notification became general the amount of puerperal infection would exceed the high figures now apparent.

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* A paper read before the Liverpool Medical Institution.

Hæmorrhages and Accidents (26).—Post-partum hæmorrhage, 8 ; post-partum hæmorrhage and sepsis, 4 ; ante-partum hæmorrhage, 4 ; placenta prævia, 4 ; ruptured uterus, 5 ; craniotomy (shock), 1.

Toxæmias (17).—Jaundice, 1 ; albuminuria (nephritis), 2 : eclampsia, 14.

Intercurrent or Pre-existing Organic Disease (63).—Pneumonia, 12 ; bronchitis, 11 ; phthisis, 17 ; heart disease, 9 ; typhoid fever, 3 ; meningitis, 2 ; cerebral abscess (latent before delivery), 1 ; cerebral tumour, 1 : insanity (hunger strike), 1 ; scarlet fever, 1 ; irritant poison and alcoholism (coroner's inquests), 1 each ; carcinoma of cervix, 1 ; cancer of liver, 1 ; tuberculosis of kidney, 1. In a few of these cases pregnancy played a small and insignificant part in producing the fatal result : in a larger number parturition was the dominant factor and the essential cause of death. It is clear that the association of conception and independent organic disease may lead to the formation of a vicious circle of a most dangerous type, and that all such cases require early and vigorous prenatal treatment.

At the Liverpool Maternity Hospital in four recent years there have been 63 deaths amongst 2934 consecutive cases, of which 1239 were complicated.

Hæmorrhages and Accidents (26).—Accidental hæmorrhage, 13 ; placenta prævia, 4 ; post-partum hæmorrhage, 1 ; craniotomy (shock), 1 ; ruptured uterus, 5 ; incarcerated retroverted gravid uterus, 2.

Toxæmias (24).—Eclampsia, 21 ; toxic vomiting, 3.

Intercurrent or Pre-existing Disease (10).—Heart disease, 5 ; pneumonia, 3 ; embolism, 1 ; appendicitis, 1.

Sepsis (3).—Pyelitis, 1 ; peritonitis following Cæsarean section, 1 ; septicæmia (associated with a septic prolapsed uterus), 1. Note that during this period of four years 88 deaths were notified in the city of Liverpool as due to puerperal fever, and that very few of them occurred amongst patients delivered in hospital—i.e., the majority occurred amongst women delivered in their own homes.

Puerperal deaths therefore fall into four groups : (1) Sepsis, commonest among women delivered at home. (2) Hæmorrhages and accidents, commonest in maternity hospitals. (3) Toxæmias, commonest in maternity hospitals. (4) Intercurrent or pre-existing organic disease, commonest in Poor-law hospitals.

Amount of Prenatal Care received by 60 Fatal Cases at the Liverpool Maternity Hospital.

A brief reference to this series will not only disclose the extent to which preventive measures were employed (or neglected) in these particular cases, but will serve as a rough standard of the present development of prenatal practice.

Toxæmias.—Eclampsia : All the 21 fatal eclamptics were brought into hospital after the onset of convulsions : five only had any sort of preventive treatment. One attended the out-patient department but persistently refused to come into hospital, although pressed to do so. The second had symptoms for six weeks and called in her doctor five days before the fits commenced. The third had symptoms for two weeks and treatment at home for two days. The fourth attended the out-patient department, was admitted after delivery with post-partum eclampsia, and died four weeks later from septic endocarditis. The fifth was the only case to develop eclampsia whilst under treatment—at the rest home attached to the hospital—a fulminant type who died 19 hours after the first fit.

Sixteen patents had no preventive treatment whatever, they were admitted (on an average) 10½ hours after the first convulsion, and 15 women died within 12 hours of arrival. An analysis of 142 Liverpool cases of eclampsia presented to the British Congress of Obstetrics, 1921, showed that only 20 (less than 14 per cent.) had received any attention prior to the onset of convulsions.

Toxic Vomiting.—Three deaths ; all three fatal cases were ill for several weeks without seeking advice, and died two, three, and nine days respectively after admission to hospital.

Accidental Hæmorrhage.—Thirteen deaths. As two women died within two hours and eight women within four hours of admission, the previous history of many of these cases was incomplete ; but only one patient had been attending the out-patient department of the hospital before the onset of bleeding. In most cases, however, the onset of the fatal bleeding was sudden and without warning symptoms.

Placenta Prævia.—Four deaths. All these patients had warning bleedings which they ignored, and were admitted to hospital more than 24 hours after the onset.

Post-partum Hæmorrhage.—One death. This case is an extreme example of the widespread ignorance and indifference of the patients themselves. The woman was a 12-para, who, in spite of a series of hæmorrhages at former labours (A.P.H. once, P.P.H. twice, and adherent placenta three times), had neglected to engage a midwife, much less consult a doctor. Skilled assistance was not obtained until after delivery, and then only after the onset of alarming bleeding. She was moribund on admission to hospital and died 50 minutes later.

Accidents of Pregnancy and Labour.—Nine deaths. Craniotomy for dystocia : One case, dying on admission from shock and hæmorrhage, the result of the repeated and unsuccessful application of forceps to a patient with unsuspected deformity of the pelvis. Ruptured uterus : Four cases, none of them associated with toxæmia or previous Cæsarean section. All had occurred before admission, and were due to the traumatic rupture of healthy uterine muscle —the end-result of obstructed labour. There had been no preliminary or prenatal examination in any of these cases ; the warning signs were therefore unrecognised, and the adoption of modern methods was fatally postponed.

Incarceration of Retroverted Gravid Uterus.—Two deaths. On admission one patient gave a history of two weeks' severe dysuria, the other seven days' anuria. Neither had received any active treatment before arrival at hospital.

Intercurrent or Pre-existing Organic Disease.—Ten deaths : Heart disease, 5 (partial prenatal treatment in two cases, none in 3) ; pneumonia 3, embolism 1, appendicitis 1. (It cannot be claimed that prenatal care would have prevented the fatal result in the last five cases.)

It is not intended to suggest that puerperal mortality will completely disappear when the adoption of early treatment is general ; but there is no doubt that the majority of puerperal fatalities belong to the class of preventable diseases, and therefore the maintenance of the present high puerperal death-rate is primarily due to the neglect of the principles and practice of preventive medicine.

Scope of Preventive Methods in Abnormal Pregnancy and Difficult Labour.

Development of Toxæmia.—In four-fifths of all cases of eclampsia there are prodromal symptoms, either headache, œdema or albuminuria, which may be present for an indefinite period before convulsions appear ; the latter are frequently heralded by other warnings, notably abdominal pain, vomiting, and disturbances of vision. Occasionally there appear to be no danger signals—some patients feel well and have large (i.e., pathological) appetites—but even here a silent or symptomless albuminuria usually precedes the toxic storm. It is no exaggeration to say that persistent albuminuria is as significant in the pregnancy of a primipara as the association of muscular rigidity and abdominal pain in the diagnosis of peritoneal infection. After the development of convulsions the outlook is always serious, for not only has valuable time already been lost, but the disturbance entailed by transit to hospital has a very unfavourable effect on the prognosis of such cases. Sometimes massive cerebral hæmorrhage, which may be an early or even initial disaster whenever the threshold of the convulsive stage is reached, will at once destroy all hope of successful treatment. Although malignant types do occur, it can be stated with confidence that some warning is usually given and that if the urine of all primiparæ were examined regularly—if the albuminuria of pregnancy were a notifiable disease and the necessary hospital accommodation available—the convulsive or dangerous stage of eclampsia would become rare and the mortality negligible. When albuminuria is detected—contamination being eliminated—the patient must be kept under observation, because sudden fluctuations in the albumin content, changes in the blood pressure, diminution in the quantity of the urine or the appearance of abnormal constituents, such as acetone, &c.,

may call for intensive treatment and perhaps the termination of pregnancy. The opinion of the late Dr. J. W. Ballantyne—the acknowledged pioneer of prenatal research—was expressed in the following statement made at the British Congress of Obstetrics in 1922:—

> "Of 800 expectant mothers, albumin was found in 254 cases. All the patients save one received preventive treatment—the one who had no preventive treatment developed eclampsia. He almost implored her to stay in hospital, for her labour was due in a few days, and the distant and near danger signals were present. The woman obstinately determined to go home—and returned with eclampsia. She was the striking exception which, in his opinion, abundantly proved the rule—the rule being preventive measures prevent eclampsia."

Dr. Eden quotes Prof. Couvelaire as saying that eclampsia has almost disappeared at the Clinique Baudelocque, Paris, and that he attributes this to the fact that the midwives are compelled to carry out regular examinations of the urine.

Mechanical Accidents of Labour.—Most catastrophes such as ruptured uterus and obstructed labour are the result of malpresentation of the child or bony deformity of the mother: their shadow is plainly visible during pregnancy to all who study prenatal diagnosis, and their successful treatment is one of the greatest achievements of preventive medicine.

No pregnant woman, primipara or multipara, should be submitted to the risks of labour without a careful consideration of her pelvis in relation to the size, lie, and presentation of the child; such routine examination, which is comparatively simple, will differentiate all pregnant women into three groups: (1) Grossly abnormal, major degrees of pelvic contraction, uterine tumours, organic heart disease, severe albuminuria. (2) Doubtful, minor degrees of contraction, bad obstetric histories—e.g., stillbirths, ante- and post-partum hæmorrhages, &c. (3) Normal.

The first group clearly requires hospital treatment or the equivalent; the second demands special supervision during the later weeks of pregnancy; whilst the third (by far the largest group) may be left with safety to deliver themselves at home. Under such conditions dystocia will disappear, perforation and the use of the cranioclast will become rare and will only be carried out under surgical surroundings on dead babies or monsters, and the unjustifiable application of high forceps with its attendant morbidity and stillbirths will be replaced by induction of premature labour or formal and safe Cæsarean section.

Prodromata of Hæmorrhage. — Placenta prævia usually gives warnings (slight bleedings in the eighth month), occasionally, however, a solitary bleeding is rapidly fatal. The same may be said of accidental hæmorrhage if one excludes the concealed type, which is almost invariably acute in onset and but rarely associated with prodromata. The majority of these concealed bleedings are seen in multiparæ (82 per cent. of the late Gordon Ley's series), and are toxic in origin; 84 per cent. of cases are associated with albuminuria, but it has not yet been determined whether the appearance of albumin precedes the bleeding or is merely coincident with it. It is hoped that further research will reveal the source and nature of the toxin and facilitate the diagnosis of the initial stages of the disease. All that can be said at present is that the pale, flabby multipara of many pregnancies is a potential bleeder, and that the appearance of albumin is of special significance in such cases.

Intercurrent or Pre-existing Organic Disease.—The relationship of pregnancy to independent organic disease has not yet received the attention it deserves, although it is well known that the process of reproduction has a profound influence on many morbid states in which the pregnant uterus may become a serious menace to life. In heart disease, for example, pregnancy taxes the reserve power of the heart. labour entails a strain which may be immediately or more remotely fatal, and embolism or persistent cardiac debility may follow an apparently successful delivery. To many of these patients the pregnant uterus is not a physiological but a malignant tumour, and it is the object of preventive research to determine the circumstances in which it is advisable and advantageous (in effect, a live-saving measure) to terminate pregnancy and prevent future conception. Of the five cardiac deaths mentioned in this paper, four occurred in multiparæ with 3, 9, 10, and 15 previous pregnancies. It is not unreasonable to think that if Cæsarean section and sterilisation had been carried out during one of their former pregnancies, the lives of these women might have been greatly prolonged.

Prevention of Sepsis.—The anatomical surroundings of the birth canal make antisepsis difficult and asepsis impossible, and it has indeed been shown that organisms are present in the vagina and even uterus after normal labour and during an afebrile puerperium. As the deeper tissues and blood-stream are easily accessible through small lacerations or through the placental site, which always offers a large venous and lymphatic portal of entry, it is a matter for surprise that dangerous infection is not more common. The natural defences, which must be extraordinary, are quite adequate to deal with natural delivery in the absence of gross contamination, and it is well known that the born before arrival invariably does well if the labour is otherwise normal. Of 28 cases born before arrival at hospital recently it was noted that the clothes of all the patients were offensively dirty, and that no personal preparation of any kind (skin, bowels, &c.) had been made: Fourteen women were delivered on arrival at the receiving room before any cleansing was possible; seven children were born in the street (in two cases the mother separated the child herself and walked a considerable distance to the hospital); three births took place in the ambulance, three in taxicabs, and one in a cookshop. In spite of these septic external surroundings every one of these women did well and the puerperium was afebrile in each case.

These results indicate that if labour is terminated *naturally* and without interference the external surroundings are relatively unimportant and the chances of auto-infection remote. The possibility of auto-infection cannot be denied, for it appears to be the only explanation of certain cases, but apart from these rare exceptions, puerperal fever is the result of infection from without.

One simple vaginal examination, if carelessly performed (with or without gloves), may carry virulent organisms from the ano-perineal skin with disastrous results. Repeated examinations are always risky, however careful one may be, and the risk increases with the amount of interference, from the application of forceps and versions to the manual removal of adherent placentæ, which is perhaps the most dangerous operation in ordinary midwifery.

Examination during pregnancy and just before term is not only perfectly safe, but will reveal most cases in which interference is likely to be required, so that suitable preparations can be made at home or the patient transferred (before labour) to hospital. In either case obstetric operations can be carried out deliberately, with surgical technique, proper assistance and equipment, and consequently with a minimum of risk of infection. The practice of pre-natal care will undoubtedly reduce the incidence of puerperal infection by limiting the number of obstetric operations undertaken as emergencies in patients' own homes, for it is these emergency conditions which are chiefly responsible for the development of puerperal sepsis.

Conclusions.

1. The majority of maternal deaths in childbirth are preventable by modern prenatal methods.
2. The majority of pregnant women receive no prenatal examination, and are therefore deprived of the advantages of modern treatment.

THE DIATHERMY TREATMENT OF GONORRHŒA IN WOMEN.

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IT has long been recognised that the treatment of gonorrhœa in women is very difficult to carry out successfully, and that the results are far from satisfactory; the fact that the gonococcus can spread by the vagina to the uterus and Fallopian tubes, and produce a general infection, renders the disease more difficult to cure in the female than in the male. Metastatic gonorrhœa occurs equally in both male and female, but the infected parts in the female are so difficult of access that local treatment is, in the majority of metastatic cases, only palliative; consequently the infected joints, &c., are not so easily treated as in the male, where the local condition can be successfully dealt with.

The usual condition found on examining a female with acute gonorrhœa is that there is a discharge from the urethra and cervix, and that the latter is eroded to a greater or less extent. The discharge from both contains pus and gonococci. From the os uteri the discharge varies; at first purulent, it later tends to become muco-purulent and ropy. It is in this condition that one sees most of the cases, and in the subacute or chronic stages, when the detection of the gonococcus is very difficult. If an acute case, the treatment of the urethra by lavage with sounds and urethroscopic treatment to follow will usually clear up the condition, but at the cervix uteri the latter is very persistent; treatment with the various medicated packs and tampons apparently produces little result, and the condition goes on until the chronic stage is reached, this state of affairs occurring even in cases restricted to bed.

Limits of Temperature Favouring Growth of Gonococci.

The hopelessness of the condition generally, and the fact that we had treated some cases of gonorrhœal arthritis with marked success, made us reason that something might be done in the actual treatment of the local condition with diathermy. It appeared obvious that as heat kills the gonococcus easily in culture, it only requires sufficient heat to kill it in the tissues; as diathermy would produce heat to the necessary extent, the idea would be to heat the cervix to such a temperature as would destroy the germs without burning the cervix. Georges Luys states that in culture the gonococcus can grow between 32° and 38° C., and that six hours at 40° will kill it. Below 30° C. colonies show no growth and tend to die at 18° C. Auguste Lumière and Jean Chrevotier, however, showed by their experiments that the gonococcus was even more resistant to cold.

Experiments carried out at the Military Hospital, Rochester Row, demonstrated that half an hour at 104° F. (40° C.) is a lethal dose for the organism. There is much discrepancy in these results. From our observations in the treatment of gonorrhœa by diathermy we conclude that a minimum temperature of 104° F. is necessary, and if that temperature is not exceeded it must be maintained for about an hour. These conclusions were arrived at in the treatment of men, in which cases the intra-urethral temperature of both the anterior and posterior urethra was taken every five to ten minutes, and in cases in which gonococci disappeared and were cured the temperature of every part of the urethra was not on an average maintained at 104° F. for longer than one hour.

Much higher temperatures can be attained and maintained in the female organs, from the fundus of the uterus to the urethra and external genitals, than in the male urethra. Gonorrhœa is easier to treat by diathermy in the female than in the male on this account, when the disease is confined respectively to these parts.

Technique.

In order to follow the technique of the treatment it is necessary to understand the physical properties of diathermy, and to dissociate it entirely from conducted and radiated heat. The tissues are very bad conductors of heat; for this reason it would be impossible by conducted heat to maintain the temperature necessary to effect a cure in the submucous tissues which have been penetrated by gonococci without burning severely the superficial columnar epithelium. By diathermy the superficial and deep parts can be equally heated; for it is penetrating, it passes through and through from one electrode to another, and is therefore ideal for the purpose. The amount of heat generated and maintained in any part under treatment does not entirely depend on the amount of current used, but on several other factors, one of the most important being the vascularity of the part. The more vascular the part the quicker the heat is carried away. The part of the body between the diathermy electrodes may be compared to the furnace of a radiator system.

The tissues are raised in temperature, and the fluid passing through the heated tissues is constantly carrying away heat, thereby reducing the temperature between the electrodes, and raising the general temperature of the body. It will be realised that any technique that retards the flow of blood through the part treated will raise the temperature of the part; this may be done by pressure of the electrodes, or compression of the vessels above or below the electrodes. The size of the active electrode exerts a powerful effect on the local temperature.

The two electrodes used in the treatment are of different sizes, the larger being the indifferent, while the smaller is the active electrode; the smaller the active electrode the greater is the concentration of heat around it. By reduction of the size of the active electrode a stage is finally arrived at when coagulation of the tissues takes place around it. The diathermy then becomes surgical. (For physical qualities of the current see THE LANCET, 1922, ii., 1316.) We have made various alterations in the shape and measurements of the active electrode; a cylindrical electrode three-quarters of an inch long and one-eighth of an inch in diameter, with rounded end, will, we think, be found the most convenient active electrode to use when the disease is a gonorrhœal cervicitis and endometritis. The circular discs should vary in size; the largest size that can be introduced through the speculum should be used. The larger the active electrode the better control can be kept on the temperature of the cervix and uterus, and the less likelihood is there of burning the mucous membrane.

Treatment of Gonorrhœal Endometritis, &c.

Presuming the case to be one of gonorrhœal endometritis, cervicitis, and urethritis, the treatment is carried out in the following manner. The patient having already been douched and placed on the couch in the lithotomy position, the indifferent electrode measuring 20 × 10 cm. is wrapped in a thick pad saturated in hot saline solution, and fixed by means of a binder on the abdomen as near to the pubes as possible. The cervix, os uteri, and urethra are cleansed with swabs. As large a speculum as possible is now introduced; in multiparæ a Haig Fergusson has generally been used, but in nulliparæ a Cusco has been found convenient.

The active electrode is screwed on to the holder and passed down the speculum; the stem of the active electrode is introduced into the os uteri with care, and the circular disc is then pressed gently against the cervix. Before the current is applied the speculum is slightly withdrawn to avoid contact with the active electrode. No overlapping of the vaginal wall should take place, the circular disc of the active electrode being kept in view throughout the treatment. The current is gradually increased, the temperature which it is desired to maintain is 107° F. It is, unfortunately, impossible to lay down any hard-and-fast rule as to the amount of current to be used; this will depend on the factors already discussed. All that can be said as a guide is that the amount of current usually necessary will vary from ¾ to 1 ampère.

The sensation of heat felt by the patient is not a good guide, as from our experience of these cases the cervix is peculiarly insensitive to heat; a superficial burn may occur without the patient suffering any discomfort. The temperature of the os was taken before the treatment commenced and was found to be on the average 99·2° F. The temperature after treatment of five to ten minutes varied from 102° to 112° F., and the difficulty of getting a correct temperature during the operation became evident.

We have now designed a combined active electrode and thermometer, which it is expected will give a constant indication of the temperature of the heated part. It would be advisable for those without experience of this operation to take the intra-uterine temperature every five minutes. Although a superficial burn of the cervix heals readily, it must be borne in mind that future treatment is held in abeyance until the part is normal again. The ordinary clinical thermometer must register within half a minute, and must be introduced into the os very quickly if the correct rise is to be registered, as the part is so vascular that the temperature drops to normal very rapidly when the current is cut off.

Treatment of Gonorrhœal Urethritis.

To treat gonorrhœal urethritis the indifferent electrode is drawn well down to the pubes; after lavage and swabbing of the urethra an active electrode which consists of a cylindrical metal rod five-eighths of an inch in diameter and of convenient length is introduced to the extent of 2½ inches into the vagina and pressed in an upward direction against the vestibule and urethra. More current will be required than for the treatment of the cervix—usually about 1½ ampères is sufficient to maintain the intra-urethral temperature at 106° F. The treatment is given for ten minutes and repeated five or six times when a cure should be effected. Smears should be taken the day after each treatment. No diathermy electrode should be introduced into the urethra on any account; the necessary lethal temperature can be attained with ease without this expedient, and all chance of a burn of the urethra avoided.

As in the case of the urethra, the duration of treatment to the cervix and uterus should be for ten minutes, provided that the temperature is maintained throughout at an average of 107° F. The results of diathermy are marked; the cervical erosion heals rapidly, the discharge becomes less, and gonococci gradually disappear from the smears. With a continuation of treatment the muco-purulent ropy discharge disappears, and quite clear mucous secretion without any gonococci in either smear or culture, is then left. Some of our cases were treated in hospital and others as out-patients; they did equally well. It is not necessary to admit cases unless they get burnt.

Diathermy Burns.

It may be necessary to explain that the burn which has been mentioned several times in the course of these observations differs entirely from an X ray burn, or the burn which originates from the electrode of a galvanic battery. The latter are sometimes most difficult to cure. Most surgeons are now familiar with the wound caused by surgical diathermy. The burn which has occurred in some of the cases is a very superficial surgical diathermy coagulation, and there has been no difficulty, in spite of the previous infection, in obtaining complete healing. We strongly advocate team work in this treatment. The technique of diathermy can only be acquired by long practice, while the selection of cases suitable for treatment, their observation, general treatment, and the verdict as to establishment of cure, are matters best dealt with by an expert in venereal diseases.

Reviews and Notices of Books.

THE MEDICAL PROFESSION IN INDIA.

By Major-General Sir PATRICK HEHIR, K.C.I.E., C.B., C.M.G., I.M.S. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 139. 7*s.* 6*d.*

Patrick Hehir began his medical study in the Calcutta Medical College and finished it in Edinburgh and at Guy's Hospital. He spent the greater part of his active life in India, filling every sort of medical appointment in military life and many in civil life, including lecturing on various subjects, health officer to a large municipality, general practitioner, and consulting physician. Since his right to speak with knowledge on the position of medicine in India is combined with discernment and a rare sense of values, his book will appeal to all who take an interest in the medical services of India or in the advancement of medicine in that great country.

The author regards the present situation as critical, for the Indian Medical Service has lost its attraction for young graduates of the home medical schools, while the deficiencies in Indian medical education have not yet been made good. The entire environment of the medical student in the United Kingdom is more salutary and invigorating than it is in the Indian colleges where the student is not taught from nursery days onwards how to make things for himself and where written examinations loom very large. While there are probably not more than a few dozen Indians with the qualifications necessary to fill professorial chairs, there were until lately hundreds of officers of the I.M.S. qualified to do so. For this reason no exception can be taken to Rule 12 of the Devolution Scheme under which the India Office has reserved 305 civil posts for officers of the I.M.S., 240 under local governments, and 65 directly under the Government of India. Medical education in India has its good points, but it is gravely behind in the ancillary subjects—pharmacology, physiology, bacteriology—and training in midwifery cannot be compared with that at home. There are no fever hospitals or hospitals for special regions, or for skin diseases, and, most surprising of all, there are no dental schools or hospitals whatever in the country.

This is the base of the position on which Sir Patrick Hehir writes his book. He gives a bird's-eye view of medical education in India, a business-like account of the Government medical services, and a description of the independent medical profession in India which is highly challenging. On the British basis of one doctor to every 1100 persons, some 250,000 independent practitioners could be utilised in India, whereas, when the Medical Registration Act came into operation in 1913, as far as could then be ascertained there were about 1770 independent medical practitioners holding registrable qualifications. Sir Patrick Hehir marvels at the small recognition by Indian philanthropists of the needs of medicine and hopes to see some of the great wealth of India diverted in the direction of more hospitals and medical schools. He will not have it that officers of the I.M.S. have been encroaching on Indian private practitioners. Everything, he says, points to the reverse, but he would like to see the house appointments at college hospitals thrown open to the successful students of the year irrespective of whether they intend to enter Government service. The Indian Government is the only civilised government in the world which provides for the medical and surgical wants of the entire population and the education of practically the whole medical profession in Western medicine; the time has ccme for the people to do things for themselves.

A chapter on public health work in India makes it clear that the sanitary work of the Indian army has been one of the best parts of our administration. Sir Patrick Hehir would make it possible for natives of India to obtain a diploma in public health and instruction in tropical hygiene without recourse to the United Kingdom. The unpopularity of the public health department with I.M.S. officers owes its origin to the drudgery of their life, the absence of executive powers, and of scope for genuine ability. But although the hygienic conscience of large towns is awaking, Western sanitation has not yet been grafted into the routine life of the people, and no preventive measures will succeed until the coöperation of the people has been obtained. The unparalleled apathy of the native Indian in face of plagues and famines still remains.

In his concluding chapters Sir Patrick Hehir deals with the Oriental systems of medicine and with the medical work of women in India. He notes the increasing tendency for the women of India to take up medicine as a profession, although at present there are no Government appointments for women doctors and prospects in private practice are not alluring. There is evidence of thought and applied knowledge on every page of this book which makes it an indispensable work of reference for Indian medical study and practice.

SURGICAL DISEASES.

The Pathological Physiology of Surgical Diseases. By Prof. Dr. FRANZ ROST. Translated by STANLEY P. REIMAN, M.D., Chief of Pathological Department of the Lakenau Hospital, and Assistant Professor of Experimental Pathology, University of Pennsylvania. London: Stanley Phillips. Philadelphia: P. Blakiston's Son and Co. Pp. 535. 30*s.*

THIS book gives an account of the normal physiology and the pathological functioning of the different systems of the body when they have been damaged by injury or disease. It is a good compilation ably presented. The author says that the object of his book is to train the student "intellectually" as well as "mechanically" in the art of surgery. This is the accepted modern view of surgical education and the object of the successful attempts to introduce the physiologist and anatomist to the wards. The laborious task of translation has been well done. The book is too good to have a title made up of such a curious combination of contradictory terms.

OPERATIVE SURGERY.

Chirurgie de la tête et du cou, Précis de technique opératoire. Sixth edition. By CH. LENORMANT and PIERRE BROCQ. Prosecteurs de la Faculté de Médecine de Paris. Paris: Masson et Cie. 1923. Pp. 338. Fr.12.

THIS is a précis of operative surgery intended both for students and for medical men in general practice; the latter, according to the preface, should be able to perform any of the operations described in the book. We should imagine that few general practitioners in this country would care to attempt such formidable operations as removal of the upper jaw or the exposure of the pituitary fossa. Many who would have the necessary skill would be unable to use it with advantage in such unusual circumstances. The book is more likely to interest English operating surgeons, who will find in it succinct descriptions of a number of operations very rarely performed in this country, while they will be astonished to find how little known in France are some of our procedures. While several routes by which access can be gained to naso-pharyngeal polypi are described in some detail, there is only one thorough description of an operation for cleft palate, a modification of what in this country is known as Langenbeck's operation; no mention is made of Lane's, or any other flap operation, or of Brophy's procedure. Again, the only route of access to the pituitary described is a trans-sphenoidal one, involving turning down the nose; Horsley's cerebral route is dismissed in a few words as being difficult and dangerous, and Frazier's operation is not even considered.

Other striking divergences from English practice could be quoted, but enough has been said to indicate that readers of this little book will find it stimulating by providing an unusual point of view, although they would probably think it necessary to consult a larger text-book before embarking on an operation which they had only seen described in précis form, with but little reference to the difficulties, dangers, and complications. The book is well printed and lavishly illustrated.

PROGNOSIS OF INTERNAL DISEASES.

By HENRY L. ELSNER, M.D., LL.D., Professor of Medicine, College of Medicine, Syracuse University. London and New York: D. Appleton and Co. 1923. Pp. 1276.

THIS is a valuable book. Not only does the author discuss the prognosis of each disease, but he has been at pains to examine the prognostic importance of the chief complications and sequelæ in each case. In many cases he quotes valuable statistics as to the incidence of such complications, and at the end of each section the well-selected bibliography will be found of value by those anxious to read more deeply into any particular subject. Many laboratory tests are discussed, the utility of each from the prognostic point of view being carefully considered. It may, in fact, be said that at a time when medical textbooks are multiplying with bewildering rapidity Prof. Elsner has produced a volume whose originality gives it an especial interest.

HEPATIC AMŒBIASIS.

Les Hépatites Amibiennes: Autochtones et Coloniales et Leur Traitement. By F. FRANÇON and J. HUTINEL, with a Preface by Prof. CHAUFFARD. Paris: Gauthier-Villars et Cie. 1923. Pp. 130.

HEPATIC amœbiasis in its manifold clinical guises is always a subject of very great interest to the physician in the tropics, and is, moreover, one with which the general practitioner, and even the specialist, in non-tropical countries is apt to be unfamiliar. This brochure by two distinguished French clinicians who gained their experiences of amœbic hepatitis and liver abscess during the war, is opportune. The diagnosis, ætiology, and pathology of these conditions are discussed with full references to the main contributions on the subject. The pleuro-pulmonary complications of liver abscess are admirably described, and recent experience has fully demonstrated the great value of the recognition of the true significance of signs at the right base. It is unfortunate that the authors should often convey the impression of attaching too great importance to the views of authorities quoted while relying too little upon the results of their own experience. A very full bibliography of 243 references is attached.

PSYCHOLOGY.

Recent Psychology and the Christian Religion. By CYRIL E. HUDSON, M.A., Assistant Curate, S. Mary Abbots, Kensington. London: George Allen and Unwin. 1923. Pp. 121. 3*s.* 6*d.*

THIS writer shows more than a literary knowledge of the first part of his subject and is to be congratulated on his sympathetic understanding. His theme is the relation of psycho-analytical observation and theory to Christian belief, and in his frank consideration he only once seriously departs from a correct statement of the position. That is when he attributes to the "Freudian school" the belief that "all human conduct, all human ideas, philosophies, religions, ideals, are the product of unconscious sexuality," a frequently repeated grotesquerie which has been dealt with by Freud in his "Introductory Lectures." A similar failure to go to original sources is indicated on p. 104, where a casual footnote reveals that Mr. Hudson has accepted a newspaper version of Prof. Sherrington's address to the British Association which ascribed to him a view of the mechanical interpretation of mind directly opposed to that which he really expressed. One feels compelled to point out these blemishes because they are not in harmony wth the rest of the book. The chapter on psycho-analysis and sin is, if one may be pardoned the emphasis, a remarkably honest presentation of psycho-analytical methods, difficulties, and results. In discussing free will the author is surely swayed by a primitive instinct when he rejects McDougall's sole justification of punishment of the wrong-doer—the hope that it may "modify his nature for the better" —and says, "This position seems to make *blame* or *censure* meaningless"; if blame or censure has no modifying influence it certainly is meaningless, except as a mild gratification of the desire for retribution.

As seems inevitable in a discussion of first principles, the argument of the book will succeed or not according to the temperament and "complexes" of the reader. In those matters—and they are vital—in which he differs from "the psychologist who is also a thorough-going evolutionist," Mr. Hudson is scrupulously fair in presenting the views of the other side: one wishes that all controversialists were like him.

Evolution of the Conscious Faculties. By J. Varendonck, D.Litt., D.Sc. London: George Allen and Unwin. 1923. Pp. 260. 10*s.* 6*d.*

This is a continuation of the theme of Dr. Varendonck's "Psychology of Daydreams." Formerly he showed how practised introspection had enabled him to trace his own pre-conscious thoughts and to deduce certain tendencies operative just below the level of consciousness. In the present work he distinguishes between reduplicative and synthetic memory; even in mankind the former need not be associated with consciousness, and it determines the automatic and reflex behaviour characteristic of lower stages of evolution; but the necessity for choice determines repression of a certain amount of reduplicative memory and demands selection and synthesis to guide the reaction to external excitations. In this way the conscious faculties of man, in whom choice is continuous, develop from those of the animal, which only from time to time departs from reduplicative action.

In spite of an involved style, Dr. Varendonck produces in his readers a sense of the reality of his subject. His work is now coming to form a useful link between the intellectualist psychology and the psychology that studies processes which take place at the lower and more primitive levels of the mind.

LABORATORY DIAGNOSIS.

Traité de pathologie médicale et de thérapeutique appliquée. Diagnostics de laboratoire. II. Tumeurs. par M. P. Masson, Professeur d'Anatomie Pathologique à la Faculté de Strasbourg. Paris: A. Maloine et Fils. 1923. Pp. 797. Fr.50.

This volume is the twenty-seventh of the whole series and the second dealing with laboratory diagnosis; if all the other volumes of the series are up to the standard of this one they deserve to be more widely known in this country. This particular volume is designed for the use of the practising morbid histologist, and consequently, in addition to a general theoretical discussion of the nature and growth of tumours, both granulomatous and neoplastic, and a full description of tumours of all sorts, it comprises an extensive and useful section on histological technique.

The "Etude Théorique des Tumeurs" is neither more nor less useful than such discussions usually are. The "Etude Concrète," however, is excellent; no class of tumours seems to have escaped the notice of the author, and of all of them his descriptions are admirably clear. What is more, these descriptions are accompanied by illustrations constituting the most valuable feature of the book; they are numerous, and the author has wisely not included a single microphotograph. In hardly any instance could the veriest tyro fail to identify a section from its appropriate illustration—and how seldom can this be said of microphotographs.

Morbid histology in this country, when it derives from abroad at all, tends to do so from German, to the exclusion of other sources. Perusal of this book calls attention to a number of interesting points not usually stressed in this country: for instance, the form of chronic mastitis, called by the author "Maladie de Reclus," occurring in young women, and illustrated by him in Fig. 49, is one which, though occasionally met with, has escaped the notice of most English writers: most pathologists will readily recognise it from the illustration, although some might disagree with the author's description of it as a "hyperplasie myo-epithéliale." Volkmann's view of the endothelial nature of the mixed tumour of the parotid is only mentioned that the author may insist on its untenability, and it is quite time that in this country the name "endothelioma" ceased to be mentioned in this connexion. On myeloid and melanotic "sarcomata" also the author holds views well worth the consideration of English workers.

And all pathologists in this country will greet with applause the author's concluding passage: "L'histo-diagnostic est un acte médical. C'est une consultation médicale dans laquelle la responsibilité de l'histologiste est gravement engagée, d'autant plus que son expertise est demandée en général en dernier ressort et commande la thérapeutique. Médecin, l'histologiste doit être payé en raison des services qu'il rend."

LIFE OF SIR T. P. ANDERSON STUART, M.D.

By William Epps, Secretary of the Royal Prince Alfred Hospital, Sydney. Sydney: Angus and Robertson, Ltd. 1922. Pp. 177.

This interesting book is partly autobiographical and partly matter compiled by Mr. Epps from documentary evidence supplied by Stuart together with personal recollections of the subject of the memoir. As Mr. Epps says himself, the book, owing to circumstances of publication, had to be cut down by about one-half and this has somewhat affected its balance, continuity, and smoothness, but the admirable introduction gives an excellent sketch of Stuart's many-sided character and activities, which sketch can be supplemented at the reader's will by reference to the main body of the work.

Thomas Peter Anderson Stuart was born in Dumfries in the year 1856, the son of Alexander Stuart and Jane Anderson his wife. He was educated at the Dumfries Academy and at the age of 14 was apprenticed to a chemist and druggist. After two years he decided to enter the medical profession, and after passing the preliminary examination during a further 18 months went to Wolfenbuttel in Germany, where he acquired a fluent knowledge of French and German. In November, 1875, he began his university career at Edinburgh, and his memories of those days and his recollections of Lister, W. Turner, and T. Keith are well worth reading. We think that his memory must have betrayed him in one small point and that is where he says (p. 29) that at this date "I saw the first young lady without a crinoline, which had been universal up to this time." He took his M.B. in 1880 and passed the first M.R.C.S. and primary F.R.C.S. Eng. examinations, obtaining in the latter 24 marks out of a possible 25. He then accepted the post of demonstrator to Prof. Rutherford, carrying with it that of assistant professor of physiology. The agreement between them, which Mr. Epps gives in full, is a curious and interesting document. With regard to fees for lectures, the Edinburgh professors in those days collected by themselves—i.e., they sold the class tickets at the door of the lecture room, "taking the money with their own hands and giving change." Stuart stigmatises this custom as "rather degrading," but whether this be so or not the custom was simply a survival of mediæval university practice, when learned doctors used to employ a couple of students to negotiate with other students as to how much each was to pay. Rashdall (Universities of Europe in the Middle Ages) gives a delightful quotation from the works of Odofredus, an eminent jurist of Bologna, announcing at the termination of one course of lectures that next year he would give no afternoon lectures because the scholars were not good paymasters, "quia volunt scire, sed nolunt solvere." The same custom of payment obtained at Paris and Oxford.

Then came the great turning point in Stuart's life, for in 1882 the Government agreed to find the money for the provision of a medical school in the University of Sydney and applications were invited for the chair of anatomy and physiology. Various competent bodies were asked to nominate a professor, and the University of Edinburgh, the Royal College of Surgeons of Edinburgh, the College of Physicians in Glasgow, and the Royal College of Surgeons of England were asked for their views. All these bodies unanimously nominated Anderson Stuart. He arrived in Sydney in 1883 and found that the medical school consisted of "a little four-roomed cottage with walls about half-way up." How the school grew both in numbers and in the various buildings from this small beginning—4 students in 1883 and 857 in 1919, while the progress of the buildings is shown by the two photographs opposite pp. 52 and 114 respectively—must be read in Mr. Epps's striking narrative. This was Stuart's life work; to this end he organised, cajoled, and drove anyone who by reason of learning, interest, or money could further his heart's desire. And all the time he was teaching as only a master could teach, besides filling such important posts as that of Government medical adviser, President of the Board of Health, and chairman of the Board of the Royal Prince Alfred Hospital. Stuart died in 1920 of an internal malignant growth, of which he first became aware in 1919, and he passed the last year of his life under sentence of death with the same courage which he had always shown during his working years. A great man to whom anyone seeing the medical school of the University of Sydney may well apply the well-known epitaph of Wren.

A GREEN OLD AGE.

By Prof. A. LACASSAIGNE. Translated by HERBERT WILSON from the second French edition. London: John Bale, Sons, and Danielsson, Ltd. 1923. Pp. 321. 15*s*.

THE increase in the expectation of life which has become so marked during the last 50 years is apparently responsible for a corresponding increase in the number of books upon old age and what may be called its management. Prof. Lacassaigne's book on the subject is one of the best which we have seen. He has himself arrived at an age which even in these days may be called advanced, for he was born in 1843; he is a medical man and professor of legal medicine in the Faculty of Medicine at Lyons, is learned and widely read. We know on the best authority that the "cruda viridisque senectus" is the attribute of a god,[1] but a study of Prof. Lacassaigne's book will enable mere mortals, if not to attain old age, at least to enjoy the fresh and youthful senescence spoken of by Virgil. It is full of sound advice and the advice is accompanied by a wealth of illustration drawn from literature both ancient and modern, from artists, and from examples of those who have attained old age and found it green. Those whose years are declining will learn if they digest the principles laid down by Prof. Lacassaigne how to temper the sadness of Ecclesiastes' picture of old age by remembering Nestor, who "yielded not to grievous old age."

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[1] Aen., vi., 304.

JOURNALS.

IN the MILITARY SURGEON for August there is a paper on Chemical Warfare and its Relation to the Medical Department by Lieut.-Colonel H. L. Gilchrist, Medical Corps, U.S. Army, who was, in the war, medical director of the Chemical Warfare Service, and afterwards head of the American Typhus Expedition to Poland. In the war we used to speak of "gas," but in future shall, he thinks, talk of "chemical agents." As these are generally heavier than air, they settle into shell-holes and dug-outs, making them dangerous, so positions on high ground will be more coveted than ever. The best protection is a gas-mask, but even a moistened handkerchief, wetted (it may have to be) with urine, is often of great value. Alkaline applications are recommended, ammonia for inhalation, weak (2 per cent.) bicarbonate of soda solution for the eyes, lime water and stronger soda solutions for the skin or to be taken by the mouth. Orderlies should be specially trained in first-aid for chemical casualties; they themselves at such times wearing always protective masks, gloves, and clothing. Every field ambulance should carry, for each person it is equipped to deal with, one litre bottle of oxygen, to be put on the stretcher with him if gassed, between his legs, its outflow being led by a rubber tube into his mouth or nose. Steam disinfection best gets chemical agents out of clothing; and shower baths, to free patients from mustard gas, should be pushed well forward, even in a battle to within five miles of the front.

Lieut.-Colonel E. L. Ruffner has a paper on the Citizens' Military Training Camp, which seems to be a very interesting effort of the Government to encourage the physical development of the people. The camp is in summer, it lasts a month, and is free to any young man over 16 and physically fit. Those who come get systematic physical training, education in discipline, order, and neatness, swimming, baseball, and other games, and are vaccinated and inoculated against typhoid, all for nothing. Colonel Ruffner was himself on the staff of such a camp in 1922; there were 2582 men in his, and the average gain in weight shown was 2½ lb. All were medically inspected on arrival, and only two serious cases were sent to hospital during the month. The State paid for their holiday and their teaching, just to make them better citizens, requiring of them no contract of service!—Dr. H. Lilienthal figures a simple and ingenious method for holding Carrel's tubes steady in a superficial wound. The tubes are bent at the ends, like capital J's, and the curved portions are worked into paraffined gauze which does not stick to the granulations, and out of the gauze the tubes do not tend to slip. This simple expedient was devised by a nurse, Miss Hervey, who served with the British Army in France.

An interesting paper shows that the disease called tularæmia is a *Bacterium tularense* septicæmia. It was first recognised in Tulare County, California, in 1912, by McCoy and Chapin, when investigating a novel epidemic amongst ground squirrels. It is found also in rabbits, and may be inoculated into guinea-pigs. It causes patches of necrosis on the livers of the rabbits, and cooks and butchers who handle these livers become infected if they have abrasions on their hands. There is inflammation at the point of entry, adenitis is associated, prostation and fever follow, with slow recovery after a month or two. Thirteen days after invasion the blood serum, in a dilution of 1 in 100, agglutinates cultures of *B. tularense*. The bacterium does not grow on ordinary agar, and only scantily on blood-agar, but, it is found by Surgeon Edward Thomas, of the U.S. Public Health Service, who presents this paper, it will grow freely on a serum-agar, with glucose (1 per cent.) and cystine (0·1 per cent.), and this in original isolation or in subcultivations. This disease was first found on the Pacific Coast, but Surgeon Thomas has found it on the Atlantic Coast too, for, out of 914 rabbit livers, taken in the market of Washington, D.C., he found seven were infected.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 29, 1923.

THE COMING INSURANCE SETTLEMENT.

THERE remain but three months before the end of the year, when new conditions for medical service under the Insurance Acts will come into force, and although the final proposals have not been made or accepted a large measure of agreement has been reached by conversations between the Ministry of Health and the Insurance Acts Committee of the British Medical Association representing panel practitioners. The fixing of the capitation fee was left until substantial agreement had been reached in regard to the services to be rendered for that fee, and within the next day or two the actual proposal in shillings and pence will reach the Insurance Acts Committee in time for its meeting on Oct. 4th. The final proposals both as regards terms and conditions of service will then be sent down to the panel committees in order that their representatives may come to a final decision in annual conference on Oct. 18th. No commendation would be too great for the spirit in which these conversations have been carried on.

Setting aside the amount of the capitation fee, which is as yet speculative, many points in regard to the terms of service have been decided to the satisfaction of all parties. These include in general terms: the limitation of panel lists, the free choice of doctor, the procedure of the Medical Service Subcommittee, procedure in regard to excessive prescribing, the right of the practitioner to have a patient removed from his list, and the access of the regional medical officer to the doctor's premises. Agreement has not been reached in regard to the right of panel committees to initiate complaints. Unless this concession is granted without giving the approved societies further facilities on their side for raising complaints, the panel medical service prefers to leave matters as they are. The proposal of the panel service to formulate a schedule of services that are outside the doctors' contract has not been accepted, and is not to be pressed, although the Insurance Acts Committee believes that such a schedule would be useful to all parties. The panel service is firm in its refusal to accept liability to give an anæsthetic or provide the services of an anæsthetist in connexion with *any* operation performed by *any* medical practitioner, although ready to make substantial concession. It is on the medical certification rules that the panel service is most keenly disappointed, for its proposals for the drastic reduction of the number of forms have not been accepted; the Insurance Acts Committee still believes that a friendly talk would solve the difficulties. The Committee's suggestion is in brief that all forms should be on two pieces of paper and that practitioners should be given the option of having these forms bound in one or other of two ways: (1) a separate book for each kind of certificate, (2) a book to contain copies of each kind of form—the one to meet the needs of urban, the other of rural practice. On one other knotty point disagreement remains. The Ministry endorsed the suggestion of its Insurance Consultative Council that in view of the unrestricted right to transfer at any time, there was no longer justification for allowing practitioners to treat insured persons as private patients. While the Insurance Acts Committee recognises the possibility of abuse, it regards the solution of this problem by regulations as impossible, holding that professional honour and increased knowledge on the part of the insured person must still be relied upon. There are insured persons who insist on exercising their inherent right not to accept the benefits for which they have paid, or who insist on going to another panel practitioner for a second opinion without mentioning the fact. Panel practitioners are often called into consultation by each other, and if no fee could be offered all consultation work of this kind would be transferred to non-panel practitioners.

We have emphasised the remaining points of divergence, although the measure of agreement is the striking feature of the situation. The agreement is indeed much greater than would be supposed to be the case from a perusal of the presidential address at the annual conference of friendly societies, which we summarise on another page. Public utterances of protagonists, although worthy of study, need not be taken quite at their face value. As the Insurance Acts Committee points out in the last sentence of its last communication, the two departments—namely, conditions of service and rate of remuneration—are indissolubly related, and any satisfactory arrangement arrived at must include both. We have substantial cause to hope that with the spirit now prevailing an arrangement will be reached towards the end of next month which will ensure good value to the insured person and willing service from the panel doctor.

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THE CARE OF THE MENTALLY DEFICIENT.

THE annual report[1] of the Metropolitan Asylums Board is a recurrent reminder of the scope and variety of remedial work which this Board undertakes. To the London medical student who thinks of the M.A.B. hospital as synonymous with the treatment of scarlet fever and diphtheria, with a sprinkling of typhoid, it may be necessary to recall that the Metropolitan Poor Act, 1867, empowered the combined parishes of the metropolis to establish asylums for the reception and relief of the sick, insane, and infirm, or other classes of the poor, without limitation to any particular infirmity; and over and above its hospitals for the common infectious diseases, for small-pox, for venereal diseases, and for tuberculosis, the Board administers mental hospitals, with a total accommodation of 8800 beds and an industrial training colony for 2200 mental defectives. In these institutions the patients are classified from the higher grade of improvable patient in training at Darenth to the senile dements at Tooting Bec and the lower grade of imbecile child at Caterham and the Fountain Hospital, Tooting; the advantage of pooling the subnormal mental population of the metropolis has been amply justified by the increased efficiency achieved by classification. The average annual number of new admissions from the metropolis is just over 1500, and there are now more than 1600 patients received by agreement with provincial authorities under the Mental Deficiency Act of 1913, in spite of the fact that the war rendered this Act largely nugatory. Some minor rearrangements have been carried out during the year, including absorption of the special children's receiving home at Tooting Bec into the general accommodation of the hospital, and some adjustments at Leavesden and Caterham designed to reduce waiting lists and increase efficiency. All the patients at the Bridge Training Home, Witham, Essex, were transferred during the year to Darenth, where the industrial work has attained very large proportions. There is an output of over 20,000 envelopes weekly from the bookbinding shop, a weekly average of 112 new or remade mattresses from the upholstery shop, 400 pairs are dealt with weekly at the boot-making shop, while brush-, basket-, and mat-making are in full swing, and the tailoring shop is kept full up with orders. All this work is so important that we welcome the expansion of the annual report to its original size and form, in which a special section, edited by Dr. E. B. **Sherlock**, director of the Board's Mental Hospitals Service, is devoted to mental diseases.

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[1] To be obtained from the office of the Board, Victoria Embankment, London, E.C. 4. 5s. Mental Diseases Section separately, 1s.

As a training ground for nurses the M.A.B. mental hospitals provide an immense scope. Dr. **Sherlock** contributes to the report a note on mental nursing which is of particular value at a time when the relation of general and special nursing is being so closely considered. Certain American States are now making it compulsory on nurses who accept registration from the State to have received some psychiatric training, and, under the auspices of the General Nursing Council, proposals on similar lines may eventually be made in Great Britain. General and mental nurses have already been placed on the same footing so far as this Council is concerned, and to gain admission both to the general and to the supplementary part of the Register, five years' training will be necessary, of which three must have been taken continuously in an approved hospital whether general or mental. The certificate of the Medico-Psychological Association is of great value to the special nurse, for it distinguishes in the third year between mental nursing and the nursing of mental defectives, albeit the whole period of training for the certificate must still be passed in one recognised institution. The Association is continuing at present to grant certificates, although after June, 1925, the examinations of the General Nursing Council will supply the only means of reaching the Register. Dr. **Sherlock** concludes his timely note with an inquiry into the respective value to mental nurses of experience and of the capacity to pass examinations, a query which he leaves for the moment unanswered. The Board's mental hospitals and training colony are also available for post-graduate medical study as they have been placed on the list of recognised institutions in connexion with diplomas in psychological medicine. This is also the case with the Royal Earlswood Institution at Redhill, which offers facilities for the scientific study of all classes of mental defectives; demonstrations and lectures are given periodically to post-graduate and other students from London medical schools, and the resident appointments should prove attractive to scientific workers willing to coöperate in the solution of the many problems still surrounding the ætiology, pathology, and treatment of mental deficiency.

Amongst the causes assigned in the Earlswood report for the mental deficiency of the 35 recent admissions are heredity, shock or indisposition of mother, prolonged labour or instrumental delivery in eight each; tuberculosis or tuberculous history in three; premature birth in two; and of the following —consanguinity of parents, fright, meningitis, convulsions, encephalitis lethargica, pituitary insufficiency —one example of each. Twenty-one, or 60 per cent., of those admitted in 1922 were under 14 years of age, but there is a large adult population accumulated during the 75 years of the institution's existence, and 16 are referred to as being over 65 years of age and four over 75. The inmates are drawn from varied social classes, 15 being classified as free cases, 19 as life payment cases, 168 as elections and part payment cases, and 20 as payment cases aided by public and local authorities under the Mental Deficiency Act. It is unfortunate that a technical difficulty has arisen in regard to the further admission of patients of the last-mentioned class, the Board of Control demanding as a condition of Treasury grants towards maintenance certain "contracts" which the Earlswood Board are unable to undertake. Details are given in the report as to the care, treatment, education, industrial training, and recreations of the inmates, the medical side of the work being in the hands of Dr. D. **Hood**, hon. consulting physician, and Dr. C. **Caldecott**, medical superintendent. The establishment of further institutions for defectives under the provisions of the Mental Deficiency Act will no doubt open careers for those desiring to specialise in this work. Moreover, there is at Earlswood a considerable scope for attaining experience in the management of diseases of children, especially of nervous type, which may be serviceable in ordinary practice.

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DIFFERENTIAL ACTION OF X RAYS.

When a beam of X rays passes through the tissues it gives rise in them to reactions which vary in severity with the nature of the tissue traversed. This is generally referred to as the selective action of the rays; it is one of the few indisputable facts in radiotherapy and is the solid basis upon which that therapy rests. There is, however, another and scarcely less important aspect of the effects of these rays upon cell life, and that is whether a differential action exists. The question was put by **Perthes** as early as 1905 whether, in the absorption of the same quantity of soft and hard rays, the same physiological effects are produced. Since that date a good deal of evidence, mostly derived from clinical experience, has been brought forward by the French school of radiologists to show that in the case of the human skin differential action of this kind takes place. Their methods of measurement, however, lacked the precision which is necessary to settle such a question, and some years later the experiments of **Friedrichs** upon a variety of organisms led him to the view that no such action existed. In our present issue a series of experiments are described by Prof. S. **Russ** which seem to establish the position once more for a true differential action. It is maintained by the author that this proof depends entirely on the method which is used to measure the various doses of X rays in question. The customary method of measurement among physicists has been one based upon the ionising power of X rays, a method that has served them so well in the past that it is difficult to understand the long delay for its acceptance in medical radiology. Even so, however, the method has its pitfalls when accurate quantitative data are required and these are dealt with at some length by Prof. **Russ**. For the specification of X rays two quantities are essential—viz., their wave-length and their intensity. Spectrometer methods are now available for the former, but for the measurement of the intensity there is no unanimity at present. We understand, however, that a joint committee of the Physical and Röntgen Societies has been formed with the object of defining a standard of X ray intensity which shall eventually enjoy international sanction and usage. If the main feature of interest in a differential action of X rays lies in its relation to the technique of the therapeutic application of these rays, it has an important bearing on the general theory of the causation of the biological actions to which the rays give rise. So far the author has determined numerical ratios for only two varieties of tissue over a moderate range of the X ray spectrum. An extension of this class of observation, both in the range of the radiation and in variety of tissue should put us in a position to evaluate the physiological response in a more general sense than is possible at the present time.

AYURVEDA AND UNANI.

It is intriguing to think that the drug lore of the Eastern world has not yet been fully exploited in the interests of scientific medicine. The discovery of the healing value of opium and quinine has its parallel in the romantic search in tropical jungles for the rare chaulmoogra tree. One of the best-equipped laboratories in India—namely, that of the Calcutta School of Tropical Medicine—is now occupied with the investigation of indigenous drugs, and Major R. N. Chopra and his assistants are examining berberine and other reputed anti-malarial drugs, in the hope that some of the remedies used by the ancient Indian systems of medicine may prove cheaper and more efficient than those imported at great cost from Europe. At this point the indigenous systems have been deemed worthy of an exhaustive report by one of the largest provincial Governments in India, and we are able to publish this week in another column a summary by our special correspondent of the conclusions of a committee appointed in November, 1921, by the Madras Government. Able and interesting as this report is, we doubt whether it will advance the repute of the Ayurvedic and Unani systems of medicine. The memorandum by Dr. S. Murti, secretary of the committee, removes the report from the ordinary criteria of reason by stating that every system of Hindu thought is at once philosophy, science, and religion, all in one and one in all. Dr. Murti gets over the present lack of modern scientific equipment by premising that the old Hindu teachers, by improving their own internal organs of sense, could extend their range of perception to include the visualisation of the atom. Modern conceptions of catalyst, enzyme, and hormone have for him had their precursor in the mysterious humours of Ayurvedic theory.

It is sadly apparent that, if there is no more to be said for this system than Dr. Murti has to say, modern medicine has little to hope for from its contribution. The truth appears to be, as Sir Patrick Hehir justly and moderately states in a monograph reviewed in our present issue, that Ayurvedic medicine has remained stationary since the Middle Ages, and that while the Unani system, with its Rhazes and its Avicenna, helped in the foundations of Western medicine it ceased to be affected by the advance of science after being carried to India by the Mohammedan invaders. Both systems have, in fact, undergone serious deterioration, for new religions were introduced, caste distinctions became more rigid, and the Brahmins, fearing to touch blood or diseased matter, left the study of medicine to the lower and illiterate castes; so that when the British founded medical schools and hospitals in India 120 years ago the native systems were in the last stage of decline. The more advanced Ayurveds now practise a hybrid combination of the Western and Oriental systems. Dr. M. C. Coman, attached to the Medical College at Madras, failed to find marvellous properties in any drug not already known to Western medicine, and even on the plea of economy he found that the cost of maintaining an Ayurvedic dispensary was much the same as that of any other dispensaries. Dr. Coman did, however, find a few drugs worthy of future study, including *Hydnocarpus inebrians*, potent in ameliorating the complications of leprosy, *Artemisia maritima*, a substitute for santonin, and *Boerhavia diffusa*, a good diuretic for anasarca. Sir Patrick Hehir demands a comprehensive investigation of native drugs and curative methods, asking for a more or less permanent committee, consisting of chemist, physiologist, pharmacologist, along with a native practitioner of high repute. His own feeling is that the attitude of indifference and hostility has been not altogether wise, for it has tended to the creation of a harmful class of quack and charlatan. The Hindu system could hardly have survived for over 2000 years, nor the Arabic system for many centuries, if they did nothing but harm, and the desire now becoming vocal on the part of Ayurvedic and Unani practitioners to bring their systems into more intimate relation with modern scientific medicine deserves recognition. We shall ourselves benefit by acquiring the useful parts of their knowledge.

Sir Patrick Hehir strikes a note of warning, for he does not believe that Western medicine has got as firm a hold on the people of India as many have supposed. The Medical Registration Act of 1916 neither included nor expressly excluded practitioners of Oriental systems, and he would solicit their coöperation in formulating curricula of education and in prescribing the courses of theoretical and practical training over some years before granting qualification to practise. Gradually the science of modern medicine could be introduced into the Oriental systems, which would then become instruments for conferring vast benefits on the people of India. There may be no other way in which adequate medical treatment will reach the masses of India in the immediate future.

Annotations.

"Ne quid nimis."

THE CENTENARY OF "THE LANCET."

On Sunday, Oct. 5th, 1823, the first number of THE LANCET appeared, and in celebration of the event a special number of the journal will be issued on Oct. 6th, and a Centenary Dinner will be held in London on the evening of Thursday, Nov. 29th, at the Hotel Victoria, Northumberland-avenue, London, W.C., at 7.30 for 8 P.M. Sir Donald MacAlister, President of the General Medical Council, will take the chair, and will be supported by the Presidents of the Royal Society, the Royal Colleges of Physicians of London, Edinburgh, and Dublin, the Royal Colleges of Surgeons of England, Scotland, and in Ireland, the Chief Medical Officer of the Ministry of Health, the President of the British Medical Association, and the Presidents of the Royal Society of Medicine and of the Medical Society of London. The Minister of Health has signified his intention of being present, and it is hoped that a gathering representative of all the interests associated with the medical profession will meet on this occasion. Those who desire to be present should communicate at their early convenience with Mr. H. D. Gillies or Dr. J. H. W. Laing (hon. secs.) at 7, Portland-place, London, W. 1.

The charge for the dinner has been fixed at 15s., exclusive of wines, and if notice be given in advance endeavour will be made to arrange that friends who so desire shall sit together.

PRIMARY CARCINOMA OF THE THYMUS.

Dr. Victor C. Jacobson,[1] of the Peter Bent Brigham Hospital, Boston, who records an illustrative case, remarks that primary tumours of the thymus are uncommon, primary carcinoma, of which this case is an example, being exceedingly rare. The first diagnosis of carcinoma of the thymus seems to have been made by Bristowe in 1854. Only 2 cases have appeared in American literature, 13 have been recorded by French writers, all between the years 1890 and 1908, and 6 by English and German observers, or a total of 21 cases. Fourteen were males, 3 females, and in 4 the sex was not recorded. The age-incidence differs from that for epithelial growths in other organs. Altogether 15 patients were of the "cancer age," 6 were aged from 18 to 22. The relatively high percentage of thymic tumours in young persons is explained by the early evolution of the thymus as compared with other organs. In 3 of the recorded cases no metastases are mentioned. Lung metastases were reported in 4 cases, direct extension into overlying lung tissue was noted in 2 cases, in one of which the mediastinal lymph glands were involved. In one instance there was growth into the superior vena cava, and in two others the pericardium was affected. In only two instances in which nodules were present in the liver was a tumour found elsewhere than in the thorax. Dr. Jacobson's case occurred in a man aged 42, in whom the outstanding clinical features were the lack of local signs of thymus tumour and the predominance of symptoms referable to the destruction of several vertebræ. The symptoms were increasing pain and stiffness in the back and hips, and lower dorsal kyphosis. In spite of the large amount of lung tissue replaced by tumour the patient had little respiratory distress until shortly before death, which occurred after about eight months' illness. Although he also had acute appendicitis, all pain and tenderness in the appendix region were masked by the constant severe pain caused by the tumour in and about the vertebral column. The thymus tumour itself was comparatively small, and could not have caused much mechanical inconvenience. The lymph and bloodstreams, however, were invaded early, the tumour being brought to the lungs by the pulmonary artery. In the lungs tumour cells gained entrance to the pulmonary veins and, reaching the systemic circulation, invaded the spine, liver, and suprarenals. The greatest interest from the pathological standpoint was the peculiar degenerative changes in the nucleus and cytoplasm of the tumour cells in the thymus and in the secondary growths.

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[1] Archives of Internal Medicine, June 15th, 1923.

THE WELFARE OF THE BLIND.

THE Blind Persons Act of 1920 imposes the duty on county and county borough councils to promote the welfare of blind persons ordinarily resident in their area. The fourth annual report of the Advisory Committee on the Welfare of the Blind records the progress now made. There are only four out of 145 local authorities who have not yet submitted schemes to the Ministry of Health for approval, and the majority of these schemes are now in operation. Their financing depends partly on the rates and partly on subsidies from the Ministry of Health, but the principle of making full use of voluntary agencies and the grant to them when necessary of financial assistance is maintained. This principle has been objected to by some theorists, but the fact remains that up to the present there has been no reduction of voluntary contributions to the funds of agencies for the blind. Out of a total of £75,000 paid by the Ministry of Health last year in respect of services provided for the welfare of the blind £33,000 went to workshops, £9000 to home workers, and £14,000 to home teaching. With regard to workshops for the blind the report states that workers in them may be grouped in four categories: (*a*) 60 per cent. are good workers, able to earn at trade-union rates 16*s*. a week in the case of men and 8*s*. a week in the case of women; (*b*) 8 per cent. are good workers but slow; (*c*) 28 per cent. are of low earning capacity capable of common work only; (*d*) 4 per cent. are devoid of any real earning capacity.

In view of the large proportion of low wage earners, the Committee recommends that there should be an efficiency and productivity test before any blind person is admitted to a workshop, and the Ministry of Health has given notice that from April 1st, 1924, it will not be prepared to recognise for grant purposes any blind person as a journeyman until satisfied that he has attained as high a standard in the quality, speed, and independence of his workmanship as is reasonably attainable by him. The problem of assisting home workers presents greater difficulties than that of assisting workshops. At the present time there are about 1000 recognised home workers, and for the time being the Committee recommends that earnings should be augmented at a flat rate not exceeding 10*s*. a week. A more important matter is the supply of teachers for home workers, and a good deal of attention has been paid to it. All home teachers, in order to earn the grant, must now pass the examination of the College of Teachers within two years from the date of their appointment. The first of these examinations was held last May at the School for the Blind, Swiss Cottage, when over 50 persons, all of them home teachers, presented themselves for examination. Besides these two classes of blind workers the Committee have approached the question how far it is possible for employment to be found for some of them in factories and workshops where ordinarily only seeing operatives are employed. In Germany it is said that as many as 450 blind persons are actually employed in ordinary factories and workshops. The report appeals to the employers of this country to interest themselves in this matter, and to grant facilities for testing the ability of blind persons to perform simple operations usually carried out by seeing workers.

The degree of blindness which qualifies for assistance under the Act is a matter needing more exact definition than it has yet had. There are a number of border-line cases who may have been encouraged for a number of years to regard themselves as blind, and the Committee favours the continuance of grants to these. On the other hand, there are a number of children in blind schools to-day, chiefly myopes and subjects of phlyctenular keratitis, who are weak-sighted but not blind. It is in the interests both of the country and of themselves that these children should be allowed to use the sight that they have under proper supervision, such as is given at the L.C.C. myope schools.

AUTO-PYO-THERAPY.

THE practice of auto-sero-therapy does not seem to be as popular as it was some years ago, and the results of the subcutaneous injection of a few c.cm. of a pleural effusion taken from the same patient have not been uniformly good. A treatment which bears at least a superficial resemblance to auto-sero-therapy has lately been advocated by Dr. Endre Makai,[1] head of a surgical children's hospital in Budapest. For more than a year he has been treating every case of localised suppuration by auto-pyo-therapy, dispensing altogether with a knife, and adopting a procedure the technique of which is perfectly simple. The pus in an abscess is aspirated, and 1 c.cm. is immediately injected subcutaneously, this procedure being repeated every fifth day as often as necessary. Several such injections have been given in each of more than a hundred cases, the ages of the patients, most of whom were children, ranging from infancy to 40. In the case of closed, cold, tuberculous abscesses, the subcutaneous injection of 1 to 10 c.cm. of the pus never gave rise to a troublesome general reaction such as fever or general malaise. On the contrary, there was often a dramatic improvement with gain of weight. At first there was no local reaction. As the injections were repeated, more and more definite areas of painless infiltration would appear. The microscopic changes in such areas were characteristic of tuberculosis, but tubercle bacilli were not demonstrable, and the infiltration always disappeared automatically. After two to eight injections, during which the pus steadily became more fluid and transparent, the abscesses dwindled or disappeared completely. Curiously enough, the subcutaneous injection of another patient's cold abscess into a person suffering from the same complaint had no effect. Good results were also obtained when a cold abscess communicated with the exterior by a fistula, but in these cases the site of the injection was apt to show a severe reaction. Most of Dr. Makai's cases of suppuration were, however, due to non-tuberculous organisms such as streptococci, staphylococci, coliform bacilli, and the like. In none of these cases did the treatment provoke progressive infection, a phlegmon, or sepsis. In about 30 per cent. there was no reaction at the site of the injection, and in another 30 per cent. a slightly painful infiltration disappeared completely and spontaneously in eight to ten days. In the remaining 40 per cent. a definitely circumscribed abscess formed at the site of injection, healing spontaneously or after aspiration. Although hundreds of such injections were given, it was necessary only in two cases to make a 3 mm. long incision. Only localised suppurative processes were, as a rule, thus treated, and among the cases there were some of suppuration in the cervical and inguinal glands, empyema, mastitis, periostitis, mastoiditis, and osteomyelitis. There were, however, two cases of severe progressive phlegmon of the neck in young children successfully treated in this manner, and one of the illustrative cases recorded in detail was that of a child, 18 months old, the right lower lobe of whose lung contained a cavity of the size of an egg. Puncture of this cavity, which was diagnosed by the X rays, yielded gaseous, greyish-yellow, thick pus containing elastic fibres, the *Bacillus fusiformis*, streptococci, and coliform bacilli. There was remittent fever reaching 39·3° C. at times, and the prognosis seemed hopeless. Five injections of 1 c.cm. of this pus were given at five-day intervals. Small abscesses with the flora of the mother abscess developed at the sites of injection. The temperature fell to 37·1° C., the exploratory puncture of the lung no longer yielded pus, the X rays showed an ill-defined shadow in the position of the former abscess cavity, and the appearance of the child was most flourishing, her weight having increased from 7·9 to 9·2 kilos in less than two months. Dr. Makai is conducting further experiments with this treatment, and he has already found that if the aspirated pus is exposed to the quartz lamp for 15 minutes before injection or is chilled for half an hour, the responses of the organism are quite different. Dr. Makai has certainly made out a case for further investigation, but this will have to be very thorough as well as confirmatory of his findings before his treatment can be accepted at his own valuation.

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[1] Deut. med. Woch., August 31st, 1923.

THE MILNE TREATMENT OF SCARLET FEVER.

IN the correspondence columns Dr. A. H. G. Burton draws attention to the great practical significance of an article on the treatment of scarlet fever which appeared in our columns on Sept. 8th, wherein Dr. G. Gushue-Taylor courageously recanted a theory of which he had been one of the principal advocates. The figures given in proof of recantation were striking, if not absolutely convincing. The fact that seems to us to rob the observations of final proof is that the figures giving the effect of return to the principle of isolation (Table A) are derived from a single year only, and from a year in which the incidence of scarlet fever was somewhat low. Figures over several years, including one in which the incidence was considerable, would carry conviction. In the same table it is noticeable that in 1920, with a total of 50 cases, there were only four return cases, a figure which is remarkably low if the eucalyptus treatment is really valueless. Nevertheless, it now seems highly probable that the facts reported by the late Dr. R. Milne are explicable on ordinary epidemiological principles. Prolonged isolation is a serious problem from educational and economic points of view, even if our experts are coming to the conclusion that mild uncomplicated cases of scarlet fever may be safely discharged at the end of four weeks; and we can only regret that Dr. Gushue-Taylor has been driven to abandon what appeared to be a hopeful alternative treatment. Nor can we feel that his remarks on the more efficient treatment of nasopharyngeal complications are very helpful, for inhalation of friar's balsam does not appear of much preventive value in other infections, and he throws no new light on the difficult choice of which tonsils to condemn and enucleate. Before resigning ourselves to the cumbersome protection of prolonged isolation, we may hope that medical officers of health, with Dr. Gushue-Taylor's admirable spirit of inquiry and progress, will make further trial with other local disinfectants such as chloramine-T.

THE REGISTRAR-GENERAL'S REPORT FOR 1921.

WE complete this week a brief summary of the concluding volume of the annual report of the Registrar-General for 1921, a report which calls for detailed study by all who wish to keep abreast of the progress of medicine in our own times. We have already singled out for special notice the section in which the writer, presumably Dr. T. H. C. Stevenson, whose name is not mentioned, illuminates the relation of tubercle to infantile mortality. This week we reproduce two charts, one of which illustrates recent remarkable changes in the age-incidence of mortality from influenza, the other the equally striking changes in that from cancer. Now that the whole "Review" (as it is now called) for 1921 has appeared it is the time to return to a consideration of the new format. The present volume is, we freely admit, handy in form and comparatively light, but further experience has not decreased our repugnance to the cramped page and the minute figures in which the tables of Parts I. and II. are printed. The change must seriously increase the difficulties of study except to the myope. It is also a hardship to the student of statistics that long months have elapsed between the publication of the tables and the text; possibly in the future a shorter interval between the three parts will be secured. The substance of the report is so well worth study that no pains would be wasted in enabling that study to be made with comfort and efficiency.

A STANDARD FOR MENTAL HOSPITALS.

ANY administrative change which would actually enforce a certain standard of treatment in mental hospitals would probably benefit the insane as a whole, provided that it carried no disadvantages in other directions. It is well known that this standard at present varies widely, and the Board of Control has no powers of enforcing changes in an institution presenting unsatisfactory features, unless a case of cruelty to a patient is proved, beyond declining to sanction transfers, a step which would be quite indifferent to the committee of the average county hospital. "Nationalisation" of mental hospitals, as suggested by Dr. A. T. W. Forrester in another column, would achieve a uniform standard of treatment, and at the same time enable the existing buildings so to be utilised as to afford separate and efficient treatment to recoverable cases. But if this "service" were made as efficient as possible, if all the varied and necessary equipment were provided, and an adequate staff paid at rates which would attract the "young, active, progressive, and best qualified members" of the medical profession (and, correspondingly, qualified recruits to the nursing profession), if, in fact, all that needs to be done were done, this service would cost not less but far more than the present cost of maintenance of the asylums. Money is the obstacle to these improvements; no one has ever suggested before that more could be done with the present expenditure of eight millions per annum; mental hospital committees, who, incidentally, work gratuitously, cannot often be accused of wasteful expenditure.

The main objection which we have to a State service is one which applies to the State management of any concern—namely, that it hampers originality and enterprise. A keen medical superintendent anxious to adopt a new form of treatment might have his scheme held up for years either on the score of expense or because some bureaucrat disagreed with or misunderstood the underlying hypothesis. At the same time some of the smaller, and in particular the private, mental hospitals would be apt to lose their traditions and individual character—assets of no small value. Outside local bodies who interest themselves in the welfare of asylum patients in a dozen different ways would feel their responsibility lessened, and much valuable work of this kind might be dropped. Dr. Forrester's forecast of uniform clothing is alarming in itself. Nationalisation should be possible without this sort of inhuman standardisation.

A CENTRAL MEDICAL INSTITUTE FOR PAISLEY.

THE medical officer of health of Paisley, Dr. G. V. T. McMichael, records in his annual report for 1922 a munificent offer. Miss Russell, of Muirfield, Paisley, intends to erect a central medical institute for the benefit of the mothers and children of the town as a memorial to her two brothers, the late Messrs. Robert and Thomas Russell. The institute, when erected, will accommodate all the various clinics conducted by the local and education authorities. Dr. McMichael pointed out in his 1921 report how severely the work of both authorities was handicapped by the hopeless inadequacy and unsuitability of the existing premises; so that no gift could have been more opportune. At the request of Miss Russell, Dr. McMichael and Dr. R. Donald, the chief school medical officer for Renfrewshire, have prepared a scheme which provides, in addition to the usual requirements of a maternity and child welfare centre, a tuberculosis dispensary and a school medical department, accommodation for clinics for minor ailments, dentistry, and eye, ear, nose, and throat affections, a remedial department for deformities, an X ray department and a disinfecting clinic for dealing with verminous children. Dr. McMichael points out the obvious advantages, from the point of view of convenience, economy, and avoidance of overlapping, in having all these clinics concentrated under one roof. A joint committee of the local and education authorities has been appointed to consider the whole question of coördination of the work. Miss Russell has approved the scheme as outlined and has appointed her architects. An ideal central site has been secured, the building will be begun without delay, and when completed and fully equipped will be handed over to the health authority, free of all cost. Paisley will be envied by other towns for being able to claim as its citizen a woman of Miss Russell's vision and generosity. Her gift is well timed in these days when public health work is hampered by lack of funds. It is also especially appropriate at a time when there is a widespread desire to secure a better coördination of the medical services employed by the various local governing bodies.

DISTRIBUTION OF ACROMEGALIC STIGMATA.

Lenz[1] recalls that while acromegaly affects several different kinds of tissue, it affects only one kind of locality in the body, for the fingers, toes, chin, nose, and ears are all distal parts. Now a very similarly distributed occurrence, not of local overgrowth but of pigment, is to be observed in one or two breeds of domestic animals, notably in a kind of rabbit called by continental fanciers "Russian," although not connected with that country. These animals are albinotic except for black ears, muzzle, paws, and tail—which parts have also a lower temperature than the rest of the body, the dividing line in the case of the ears being very sharp, for the auricle at its insertion is warm, while a millimetre or two higher up, just where the black pigment begins, it is markedly cooler. The author cites a number of experiments, illustrated by photographs, from which he deduces that the lower temperature is indeed productive of the pigmentation. If in winter time some white hair were removed from the back, the new growth was pigmented, and least so at the edges of the denuded area, where the surrounding hair might be expected to afford some protection from the cold. If summer were chosen for the experiment, the new hair showed less pigment, and particularly at the roots, where again there would be most protection from the cold; moreover, in summer the new pigmentation was not permanent, its disappearance beginning at the edges of the patch. The critical skin temperature, below which pigmentation followed, seemed to be about 25° C.; and Lenz mentions that certain ferments, such as might be concerned in bringing about pigmentation, are active only below a certain temperature. Some confirmatory circumstances are next adduced. The new-born rabbits, which, of course, in the womb or in the nests are not exposed to cold, are nowhere pigmented. The characteristic pigmentation of distal parts increases in winter and decreases in summer. Small and weakly animals showed it best. Conformably with this, breeders recommended keeping the animals in unheated hutches; moreover, the whole breed was very small and delicate, as might be expected, for clearly it was being selected for cold extremities, and so for a weak blood circulation. The peculiar "Russian" marking, to be seen in a breed of guinea-pigs and of cats (Siamese) as well as in rabbits, probably depends then upon incapacity to form pigment in presence of a temperature higher than 25° C. For this same reason—namely, that they have the weakest blood circulation and therefore the lowest temperature—may the distal parts be chosen for dysharmonic growth in human acromegaly. The essential cause is, of course, an over-functioning of the hypophysis; but its hormone may be more active at a temperature rather below that of the central parts of the body. It is also conceivable that one of the functions of this gland is to stimulate metabolism at low temperatures, for the northern European races are of more acromegalic aspect than the southern ones. This is, of course, in accordance with the view of racial characters being dependent upon endocrine influence. The suggestion is made that a desirable experiment would be for an early acromegalic subject to wear continuously a warm glove on one hand only, to see if this hand showed difference in growth from the other one.

BOARD OF CONTROL: ANNUAL REPORT.

THE ninth annual report of the Board of Control, besides providing interesting statistics, surveys as usual the events of the year (1922) in connexion with the treatment of the insane and the mentally deficient. Most of these events have already been chronicled and discussed in our columns, and it remains to congratulate the Board on their progressive attitude, their tolerance of criticism, and their manifest anxiety to use interest, when it appears even as adverse judgment, to better the conditions under which the insane are detained. It is admitted that there are many directions in which improvement is possible in the way of prevention and of cure, but it is emphasised throughout that improvements and developments must involve increased expenditure, the incurring of which the community must be prepared to sanction. If the result of agitation is to arouse in the mind of the public a permanent and not a merely fitful and evanescent interest in the welfare of those suffering from mental disorders much good may result. Some few reforms are not dependent on outlay and are being actively encouraged—for example, permission to a patient to wear his own clothing, or at least to retain the same suits, dresses, or boots when transferred to another ward.

In discussing the annual report for the year 1920, we deprecated the small amount of space devoted to an account of the research work done in mental hospitals. This year a supplement of 25 pages summarises scientific work accomplished and in progress at 12 institutions, ranging from work on the ætiology and pathology of obscure diseases to comparative studies in different methods of treatment, including the inoculation of malaria parasites in the attempt to influence general paralysis of the insane. Future research is to be even more extensive. The establishment of the Birmingham Joint Board of Research, under the directorship of Sir Frederick Mott, into the causes of mental disorder is viewed with favour by the Board, who announce their hope that corresponding research centres will be instituted in connexion with each university in England and Wales, and that with each of these centres will be grouped and affiliated every neighbouring institution in which mental cases are received. The function of these centres should be research, and should include such investigations as cannot properly be undertaken in a small clinical laboratory. This latter provision now exists in a considerable number of mental hospitals, but by no means in all of them, and it is the strong view of the Board that no mental hospital should be without one. Work should be systematically prosecuted in these laboratories, not only supplementary to post-mortem examinations, but in aid of routine clinical investigation. Further, with the institution of research centres, the Board hope to see the development of mutual coördination between them whereby interchange of information would be facilitated, results usefully compared, and needless duplication of effort avoided.

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[1] F. Lenz: Archiv für Rassen- und Gesellschafts-Biologie, Bd. xv., H. 1, S. 24.

LONDON MEDICAL EXHIBITION.

ON Oct. 1st, and during the four days following, the fifth London Medical Exhibition to be held since the war will occupy the Central Hall, Westminster. We understand that the promoters have taken pains to assemble all the most modern developments in scientific appliances, preparations, and publications likely to be of interest to the medical world. The exhibition thus represents the outcome of scientific research brought into the realm of practical utility by commercial enterprise. It is a far cry to the time when the physician digged his own herb-garden and his medical books were family heirlooms; to-day commerce has advanced hand in hand with science, and we owe it in no small measure to the great medical and surgical houses that modern medicine has reached its present high level of practical achievement. The large number of doctors, not only from the metropolis, but from all parts of the world, who in past years have visited the exhibition has definitely established the value of this undertaking. The fact that the general public is rigidly excluded refutes any suggestion that this exhibition is run for trade purposes alone; experience in the past has shown that the benefits accruing to trade and profession have been mutual. It is of importance to a practitioner that he should be familiar with the products of those firms that cater for his requirements—both in his own interests and in those of his patients. The exhibition affords an opportunity to taste, see, and handle which can be had so easily and so conveniently in no other way.

Sir Archibald Garrod has been appointed to serve on the Medical Research Council to replace Prof. F. Gowland Hopkins, who retires under the provisions governing the rotation of membership.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held on Oct. 12th and 13th in the Town Hall, Carlisle, commencing on Friday at 7.30 P.M., when a discussion will take place on "Public Health Administration of Measles and Whooping Cough, from the points of view of a County Borough and a County Area," to be opened by Dr. J. Beard and Dr. F. H. Morison, Dr. T. Eustace Hill presiding. A discussion on "Some Aspects of Housing in Carlisle" will be opened by Mr. Percy Dalton, followed by Mr. A. Horsburgh Campbell, Dr. A. K. Chalmers, Dr. Kenneth Fraser, Dr. G. W. N. Joseph, Dr. Harold Kerr, Dr. E. W. Rees-Jones, Dr. J. E. Spence, Dr. J. T. Wilson, and others. On Oct. 13th visits will be paid to various works in the neighbourhood.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXVIII.

THE TREATMENT OF GLYCOSURIA IN PREGNANCY.

THE urine of a pregnant woman should always be examined at intervals, since albumin or sugar may be present in the urine some considerable time before any other signs or symptoms appear. Fehling's test is generally used for sugar, though it is not very delicate and may give rise to error. The error may be due to (1) bad Fehling's solution, since if the two solutions A and B are mixed, and then kept for a long time, the solution may reduce itself when it is boiled; (2) the presence of other substances, such as creatinine, uric acid, and glycuronic acid, which reduce Fehling's solution. Thus a positive test with Fehling's solution must be confirmed by other tests. The simplest of these is Benedict's, which is gradually replacing Fehling's for clinical work, as it is more reliable and gives very little more trouble; 5 c.cm., or 90 minims, of Benedict's solution and 10 drops of urine (as measured with a dropper) are boiled together. If dextrose is present in a concentration of over 0·5 per cent. there will be a precipitate in about 30 seconds after the onset of boiling, but to make certain the mixture should be boiled for two minutes. If the solution remains quite blue it means that sugar is present in a concentration of less than 0·1 per cent.; if the colour turns green it means that there is more than 0·1 per cent. present. Instead of boiling for two minutes over the flame, the test tube, after the solution has been well mixed, may be placed in boiling water for five minutes, which is perhaps an easier method for a busy practitioner.

Differential Diagnosis of the Reducing Substance.

A positive Benedict's test does not necessarily mean that dextrose is the reducing substance present in the urine, since (1) lactose, (2) lævulose, (3) a pentose, (4) homogentisic acid all give a positive test. (3) and (4) are very rare, but (1) and (2) must always be considered; the distinction between these requires some knowledge of chemistry.

Lactose may be present in the urine of a pregnant woman as soon as the breasts show signs of activity, but is usually only present (*a*) in the last weeks of a pregnancy; (*b*) after the child has been born; (*c*) if the lactation has been abruptly checked. Lactose is not fermented by yeast, and it is further distinguished by the difficulty of preparing the osazone crystals by heating with phenyl hydrazine and potassium acetate. The crystals, if formed, differ in many respects from those of glucosazone. Lactosuria is a harmless condition, which will pass away when lactation comes to an end, and demands no treatment.

Lævulose is present in the urine under certain conditions. (1) If the liver is seriously damaged, as in acute yellow atrophy of the liver, poisoning with salvarsan, or trinitro-toluene. Lævulose is often used as a test for the condition of the liver, since it may be excreted in the urine after a dose of 25 g. of lævulose. It is better to estimate the amount of sugar in the blood after the dose of lævulose, since, if it is raised at all, it is probable that the liver is considerably damaged. (2) Lævulose may be present under conditions which have no known pathological importance, and may be excreted for years without any symptoms. (3) It may be present during pregnancy; Cammidge has found that in 25 per cent. of cases, when a reducing substance is present in the urine of pregnant women, it proves to be lævulose. Lævulose reduces Fehling's and Benedict's solutions, is fermented by yeast, and gives osazone crystals which are identical with those of dextrosazone. It can therefore be distinguished from dextrose only by the fact that it rotates the plane of polarised light to the left. This test can only be made with the aid of a polarimeter. If lævulose is present in the urine during the course of a pregnancy the question of serious damage to the liver should be carefully considered, but if there is no evidence of this it is probable that the lævulosuria has no significance and the condition can be safely neglected.

Significance of Dextrose in Urine.—When it has been proved that the reducing substance in the urine is dextrose it does not follow that the patient is suffering from diabetes mellitus. Any of the following conditions may cause dextrose to appear in the urine: (1) exophthalmic goitre, (2) acromegaly, (3) renal glycosuria, (4) temporary diminution of sugar tolerance, (5) true diabetes mellitus. Exophthalmic goitre and acromegaly can easily be diagnosed and need not be further considered.

Renal Glycosuria.

With the knowledge gained from the estimation of the sugar in the blood, it has been realised that dextrose may be excreted in the urine without there being any increase in the amount of sugar in the blood, and therefore no diminution in the sugar tolerance. This condition is termed a renal glycosuria, and it is believed that the threshold of the kidney—i.e., the point at which sugar is excreted in the urine—is lower than in normal persons. This condition occurs in from 0·1 to 1 per cent. of the population, and is usually only discovered by accident, as the patients do not have any of the ordinary symptoms of diabetes mellitus. The diagnosis may be suspected from the history of the discovery of the sugar and the absence of any symptoms, but can only be made with certainty if an estimation of the blood-sugar is made at half-hour intervals after a dose of 25–50 g. of dextrose. The blood-sugar curve will resemble that of a healthy person who has a normal sugar tolerance, in that it will not rise above 0·18 or 0·19 per cent. at the end of half an hour and will have returned to normal after one, two, or three hours. Sugar, however, will be excreted in the urine in amounts of 1 to 4 g. (15–60 gr.) per hour by the patient who has a renal glycosuria. Some patients with a renal glycosuria excrete sugar when the blood-sugar is quite normal—i.e., 0·08 per cent.—while others do not begin to excrete sugar until it has risen above 0·13 per cent. or so. The diagnosis can be clinched by adding definite amounts of bread, 4, 8, 16 oz., on successive days and estimating the amount of sugar excreted. A patient with renal glycosuria will excrete very little more sugar after the 16 oz. than after the 4 oz. of bread. The total amount of sugar will vary in different cases from 5 to 30 g. (75–450 gr.). Once the diagnosis has been made the patient does not require any treatment, and may eat ordinary food. Several women who have had a renal glycosuria for many years have borne children without suffering any ill-effects, and the children do not necessarily have a renal glycosuria, although this is often the case. It has recently been shown that a renal glycosuria may be caused by pregnancy, since the threshold of the kidney for dextrose is altered during pregnancy. Sugar may be excreted in the urine, although the sugar tolerance is normal, and the blood-sugar does not rise above the normal limits. The amounts of sugar which are excreted are small, and usually only appear after a large dose of sugar—i.e., 100 g.—has been given. The correct diagnosis may be suspected from the complete absence of symptoms and the small amount of sugar which is excreted, and can be established by estimating the blood-sugar. The condition requires no treatment.

Temporary Diminution of Sugar Tolerance.

In all the conditions hitherto described there has been no reduction of sugar tolerance, but a certain number of pregnant women do develop this. The actual amount of sugar which is excreted is not large—10, 30, or 50 g. in the day. These amounts are either the same or a little larger than those excreted by patients with a renal glycosuria, so that the diagnosis cannot be made by examination of the urine. It can only be made with certainty by estimating the blood-sugar at intervals after a dose of 25 or 50 g. of dextrose. If there is a diminution of sugar tolerance the blood-sugar, half an hour after the sugar was taken, will be either already above 0·20 or quite close to this point; at the end of one hour the blood-sugar will be above 0·20, and will not have returned to normal at the end of two hours, or perhaps three or four hours. Such a curve is typical of a diminution of sugar tolerance; some information can be obtained by estimating the blood-sugar at the end of one hour only, since if the blood-sugar is above 0·20 at this point there is a diminution of sugar tolerance. The urine before the test may not contain any sugar although the blood-sugar is normal, but since many patients who are pregnant are believed to have a lowered threshold for sugar, there may be a coexisting renal glycosuria. The course which the condition runs is almost invariably favourable, since after the child is born the sugar disappears from the urine; it may reappear during the next pregnancy. The patient will need careful watching; the total output of sugar should be estimated and the carbohydrate intake reduced to a definite amount, say 4 oz. of bread. If the output of sugar is reduced to about 10 g. this reduction is probably sufficient, especially if the blood-sugar when fasting is normal, since there may be a coexisting renal glycosuria. If there is little reduction in the output it is wiser to adopt more drastic measures and starve the patient for one or two days in order to get rid of the sugar from the urine. The diet should then be gradually increased according to any of the modern methods used in the treatment of patients with diabetes mellitus. If the sugar remains absent, or is very small in amount, cautious increase in the starch food may be made: 1 oz. of bread is added every second day up to 4 oz. This procedure may be modified if insulin is used; it is probable that 5 or 10 units of insulin will enable these patients to eat moderate amounts of bread without passing any sugar, or only a trace. When the urine contains no sugar treatment should be controlled by an occasional blood-sugar estimation.

True Diabetes Mellitus.

In all the conditions so far described the patient will not complain of symptoms ascribable to diabetes mellitus, and the sugar will usually be discovered by accident. A certain number of patients do, however, develop true diabetes mellitus, and it is the fear of this complication which makes the periodical examination of urine during pregnancy important. Patients with a severe form of the disease will complain of thirst, weakness, &c., and the diagnosis will be made because the patient consults her doctor for these symptoms. But patients with a mild form of the disease may not complain of any special symptom at first, and the diagnosis may only be made in the course of a routine examination. Once it is confirmed the patient must have the full régime of diabetic treatment with periods of starvation in order to keep the urine sugar-free and the blood-sugar normal. Here insulin will alter the accepted treatment considerably, since the starvation will probably be much abbreviated, if, indeed, it proves necessary. The question whether the pregnancy should be allowed to continue, or should be terminated, must be carefully weighed. It depends to some extent on whether the patient is near term. If she is near term it is better to treat the diabetes energetically and allow the pregnancy to continue normally. If, however, the disease has started early in the pregnancy it may be wiser to terminate it. All these statements depend on the severity of the attack and the response to treatment. The influence which insulin will play is probably considerable, and no pregnancy should be terminated without very careful consideration.

GEORGE GRAHAM, M.D. Camb., F.R.C.P. Lond.,
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Special Articles.

STUDIES ON THE PNEUMOCOCCUS.

TWELVE months ago we reviewed in these columns[1] a report from the Ministry of Health by Drs. F. Griffith and A. Eastwood[2] on the pneumococcus. The work detailed in this report has now been followed up by a further inquiry on the same subject by these two workers[3] prefaced by an introduction by Sir George Newman. In the first section on the influence of immune serum on the biological properties of pneumococci, Dr. Griffith takes as his starting-point the old conception of a pure culture of a bacterium as consisting of a number of absolutely identical individuals. This conception he considers to be erroneous and quotes in support of his view the recent work of Arkwright and of Benians on *B. dysenteriæ* and of Mary Cowan on the streptococci. Practically all recent work, in fact, emphasises this point—viz., that bacterial variation in a pure culture is distinguishable without there being any suggestion of a true transmutation of bacterial species. In other words, in spite of variation the pneumococcus is still a pneumococcus and not a staphylococcus or other organism. By growing different serological types of pneumococci in immune serum Dr. Griffith shows that when these types are cultivated on homologous serum, growth takes place in the form of clumps and long chains or gelatinous balls which deposit at the bottom of the tube; and that when this primary culture is shaken and plated, in addition to the normal type of colony, there appears on the plate subculture a variable number of colonies of size, appearance, and consistency different from the normal colony. The normal type of colony is referred to as S and the variant as R. A second passage through serum culture yields a larger number of variants from the normal, and a third passage finds the normal S form replaced by the R variant forms. Finally, after suitable subculture a stage is reached at which a single colony culture of either type, with some exceptions, breeds true. The normal S type of colony is circular and dome-shaped, with a smooth, shiny surface and an almost watery consistency. The variant or R type is a rough type of colony, dull or finely granular, and more coherent than the normal type. At first, also, the rough variant is generally smaller than the smooth normal colony. Both are equally bile-soluble. These changes, it should be borne in mind, are all produced by growing the serological types of pneumococci in cultures of homologous serum; heterologous sera appear generally to have no power of producing the rough variant colony from the smooth normal. The latter remain stable if kept virulent by passage through animals and growth in blood broth, whereas a rough variant after retaining its characters for many generations on blood broth may revert subsequently to the smooth type. Again, the smooth normal colony culture remains pathogenic for mice, whereas the rough variant shows a high degree of attenuation. Dr. Griffith quotes a smooth type killing in 0·000,000,01 c.cm. of broth culture and a rough variant from the same original strain having no effect in a dose of 0·2 c.cm. Finally, these two types of colony are shown to have different antigenic qualities. The S type produces in young broth cultures a soluble substance which the R colony does not, the former agglutinates with specific serum with a firm gelatinous precipitate, the latter produces loose clumps which are readily shaken up, whilst other immunological distinctions (e.g., with absorption) are also noted.

Dr. Griffith points out that here we have a definite morphological criterion for distinguishing between virulent and attenuated strains, and that immune sera should always be prepared entirely from S type cultures. The alteration from the S to the R type he considers to be a degenerative tendency present in many bacterial strains, and is therefore consonant with the work of other observers quoted at the beginning of our review. The S and R types possess related antigens but R lacks an antigen contained in S; witness the results obtained in absorption experiments. The author believes that an explanation of these phenomena can be found in the intimate association of the pneumococcus capsule with the existence of virulence. Briefly it is the outer portion of the pneumococcus which is modified in the change from smooth to rough type of colony—hence the latter loses the typical smooth, shiny surface and watery consistency and becomes dull and granular, whilst the individual cocci tend to adhere. This modification, it is suggested, is due to a substance soluble in salt solution which is not secreted in the attenuated R type of colony and which is intimately concerned with the virulence and capsule formation of the S type.

In the second part of this report Dr. Arthur Eastwood discusses the questions raised by his colleague's work of bacterial variation and transmissible autolysis and the relation of bacterial enzymes to bacterial structures. He points out that bacterial variation is no mere haphazard quality, but that it tends always to some one definite direction, and he shows how in the process of reproduction aberrant or variant forms may conceivably, on theoretical grounds, occur. Thus the transmissible lytic substance of the Twort-d'Hérelle phenomenon is not merely an agent for destroying bacteria but a method of producing bacterial variants. We are thus faced with the biological problems of variation and reversion to type, probably intimately bound up with questions of virulence. Dr. Eastwood sums up a most interesting and thoughtful memorandum by formulating a general statement that the constituents of living protoplasm have two functions: (1) a catalytic action which prepares food material by means of appropriate enzymes, and (2) a synthetic action by which new protoplasm is built up. He suggests that the balance between these two functions may be very finely adjusted and any disturbance of it may lead to the production of bacterial variants.

The Medical Research Council Report.

This report has now been succeeded by one from the Medical Research Council[4] which approaches the pneumococcus from the standpoint of the clinical pathologist, and the two together make a valuable study of this organism, pointing the way to the solution of many bacteriological and clinical problems which have hitherto made this subject the battleground of many inconclusive struggles. The first part of the report of Dr. E. E. Glynn and Miss Lettice Digby is concerned with laboratory technique in which the various modern methods of investigation are detailed—and their name is legion. No good purpose would be served by reviewing these in detail, but we believe the authors have maintained throughout a well-balanced perspective. We would, for our part, heartily endorse their opinion that bacteriologists, as a rule, make far too little use of low-power binocular lenses for plating and culture work generally. Bile solubility also is better tested with deoxycholate than with whole ox bile and can be controlled more readily with the microscope. We also confess to a deep sigh of relief to find that sugar fermentation tests are relegated to a relatively subordinate position. En passant it is becoming more and more urgently necessary for bacteriologists to agree on a more or less standardised method for estimating hæmolysis of blood media. But these are merely technical points, and for most readers the main interest of the report will lie in fresh light it throws on the various bacteriological aspects of therefore be distinguished from dextrose only by the fact that it rotates the plane of polarised light to the left. This test can only be made with the aid of a polarimeter. If lævulose is *present in the urine* during the course of a pregnancy the question of serious damage to the liver should be carefully considered, but if there is no evidence of this it is probable that the lævulosuria has no significance and the condition can be safely neglected.

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[1] THE LANCET, 1922, ii., 623.

[2] Reports on Public Health and Medical Subjects. No. 13. H.M. Stationery Office. 1922. 2s. 6d.

[3] Reports on Public Health and Medical Subjects. No. 18. H.M. Stationery Office. 1923. 1s.

[4] Bacteriological and Clinical Observations on Pneumonia and Empyemata, with special reference to the Pneumococcus and to Serum Treatment. By Ernest E. Glynn, F.R.C.P., and Lettice Digby. Published for Medical Research Council by H.M. Stationery Office. 1923. 5s.

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Renal Glycosuria.

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the work of other observers quoted at the beginning
our review. The S and R types possess related ant
gens but R lacks an antigen contained in S: witne
the results obtained in absorption experiments. Tl
author believes that an explanation of these phen
mena can be found in the intimate association of tl
pneumococcus capsule with the existence of virulenc
Briefly it is the outer portion of the pneumococcus whi
is modified in the change from smooth to rough ty
of colony—hence the latter loses the typical smoot
shiny surface and watery consistency and becomes du
and granular, whilst the individual cocci tend
adhere. This modification, it is suggested, is due to
substance soluble in salt solution which is not secret
in the attenuated R type of colony and which
intimately concerned with the virulence and capsu
formation of the S type.

In the second part of this report Dr. Arthur Eastwo
discusses the questions raised by his colleague's wo
of bacterial variation and transmissible autolysis a
the relation of bacterial enzymes to bacterial structur
He points out that bacterial variation is no me
haphazard quality, but that it tends always to son
one definite direction, and he shows how in the proce
of reproduction aberrant or variant forms may co
ceivably, on theoretical grounds, occur. Thus tl
transmissible lytic substance of the Twort-d'Hérel
phenomenon is not merely an agent for destroyi
bacteria but a method of producing bacterial varian
We are thus faced with the biological problems
variation and reversion to type, probably intimate
bound up with questions of virulence. Dr. Eastwo
sums up a most interesting and thoughtful mem
randum by formulating a general statement that t
constituents of living protoplasm have two function
(1) a catalytic action which prepares food materi
by means of appropriate enzymes, and (2) a synthet
action by which new protoplasm is built up. I
suggests that the balance between these two functio
may be very finely adjusted and any disturbance of
may lead to the production of bacterial variants.

The Medical Research Council Report.

This report has now been succeeded by one fro
the Medical Research Council[4] which approaches t
pneumococcus from the standpoint of the clinic
pathologist, and the two together make a valua
study of this organism, pointing the way to t
solution of many bacteriological and clinical proble
which have hitherto made this subject the batt
ground of many inconclusive struggles. The first pa
of the report of Dr. E. E. Glynn and Miss Lettice Dig
is concerned with laboratory technique in which t
various modern methods of investigation are detailed
and their name is legion. No good purpose would
served by reviewing these in detail, but we believe t
authors have maintained throughout a well-balanc
perspective. We would, for our part, heartily endo
their opinion that bacteriologists, as a rule, make f
too little use of low-power binocular lenses for plati
and culture work generally. Bile solubility also
better tested with deoxycholate than with whole
bile and can be controlled more readily with t
microscope. We also confess to a deep sigh of reli
to find that sugar fermentation tests are relegated
a relatively subordinate position. En passant it
becoming more and more urgently necessary f
bacteriologists to agree on a more or less standardis
method for estimating hæmolysis of blood media. B
these are merely technical points, and for most reade
the main interest of the report will lie in fresh lig
it throws on the various bacteriological aspects

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[1] THE LANCET, 1922, ii., 623.

[2] Reports on Public Health and Medical Subjects. No. 13. H.M. Stationery Office. 1922. 2s. 6d.

[3] Reports on Public Health and Medical Subjects. No. 18. H.M. Stationery Office. 1923. 1s.

[4] Bacteriological and Clinical Observations on Pneumo
and Empyemata, with special reference to the Pneumococ
and to Serum Treatment. By Ernest E. Glynn, F.R.C.P., a
Lettice Digby. Published for Medical Research Council
H.M. Stationery Office. 1923. 5s.

pneumonia; 140 cases of pneumonia and 50 of acute empyema were investigated by the authors, as well as saliva from normal controls and a group of miscellaneous pneumococcal and streptococcal infections. The authors found that in the case of sputum or saliva the mouse inoculation test yielded the most certain results for the finding of pneumococci, whilst streptococci, on the other hand, usually came out best on direct plate cultures. Lung-juice cultures obtained by means of exploratory puncture with a 10 c.cm. record syringe and a medium needle are advocated as a safe and valuable aid to diagnosis. In adults 45·1 per cent. and in children 61·5 per cent. examined in this way yielded positive results and afforded a reliable guide as to clinical prognosis, the mortality amongst positive cases being 50 per cent., as against 9·1 per cent. in the negative cases. The blood culture findings were equally striking, 45 per cent. showing positive results with a mortality of 71·4 per cent. in the positives and 8·3 per cent. in the negatives. The authors also isolated 23 strains of intermediate pneumo-streptococcal strains. Most of these were eventually assigned to one or other group but five strains remained definitely unclassifiable, their colonies being intermediate in character, their morphology generally diplococcal in serum broth and other crucial tests equivocal. These so-called intermediate pneumo-streptococcal strains are a source of much confusion in all bacteriological investigations made via the mouth, and chronically enlarged tonsils in our experience are particularly liable to harbour them. It is interesting to note that in the report under consideration a larger number of these intermediate types were ultimately classified as pneumococci then as streptococci. Whether or not we are encountering here the question of bacterial variation it is impossible at present to say, but the question is worthy of detailed investigation.

Space does not admit of a discussion of the various points raised with reference to the typing of the pneumococci, the classification of streptococci, and the identification of the numerous other organisms isolated from these pneumonia, empyema, and miscellaneous infections, but the question of clinical and bacteriological correlation cannot be passed over. In the empyemata of young children the Type I. pneumococcus cases were more often secondary to pneumonia than the Group IV. pneumococcus and the streptococcus cases. Also on the average the Type I. pneumococcus cases had a higher temperature and in the recoveries a shorter illness than the others. Amongst the pneumococcal pneumonias onset with rigor and termination by crisis was commoner with the Type I. cases than with Group IV. cases, whilst the temperature of Type I. cases was of shorter duration, more often continuous, and the sputum more often rusty than in Group IV. cases. It would seem, therefore, that Type I. pneumococcus produced the more typical clinical type of case, and this may not be without bearing on the larger bacteriological issue when we consider the fact that Group IV. pneumococcus is such a heterogeneous collection. It was also further noted that cases beginning with rigor had a heavier plate incidence of pneumococci than those whose onset was gradual. We cannot but regard this correlation of clinical and bacteriological findings as extremely valuable, as it is by means such as these that diagnosis becomes an accurate business. Indeed, reviewing these and other acute infective diseases of known bacterial origin we should say that the most notable advances made of recent years have been in the direction of rendering diagnosis more accurate, and in the long run more efficient treatment must surely follow. The authors of this report conclude by pointing out that the mortality from pneumonia, excluding influenza, is slowly increasing in England and Wales and is now greater than that from phthisis. To quote their concluding sentence: "A systematic investigation, by standardised methods, at a few centres in Great Britain, of the flora of normal mouths and of bronchitic and pneumonic sputa would furnish valuable in[illegible] tion regarding factors [illegible] the incid[illegible] mortality from, pne[illegible] influenza[illegible]

VITAL STATISTICS FOR 1921.

THE REGISTRAR-GENERAL'S REVIEW.

(*Continued from p. 582.*)

Causes of Death.—The first causes of death considered in the Review are the acute infectious diseases. Among these *enteric fever* is rapidly becoming a disappearing disease. In 1921 it was responsible for only 613 deaths, as compared, for instance, with nearly nine times this number in 1890 in a much smaller population. The death-rate in 1921 was only 16 and in 1920 was only 14 per million of population, the lowest figures hitherto attained. It was much higher in the north of England than elsewhere, and, strangely enough, was slightly higher in the aggregate rural districts than in London.

Fatality of Certain Infectious Diseases.—On page 40 is an interesting table showing the case-mortality of some of the chief infectious diseases. The rates are given with reserve, owing to possible defects of notification, and because in the case of small-pox the number of cases is too small to have significant rates based on them. Between 1911 and 1921 the case mortality of enteric fever varied between 15·8 and 20·6 per cent., of scarlet fever between 0·95 and 2·0 per cent., of diphtheria between 7·2 and 10·9 per cent., while that of small-pox (subject to the above-mentioned warning) varied from 1·6 to 42·9 per cent. The corresponding percentages for poliomyelitis and meningococcal meningitis indicate defective notification of cases.

Measles.—The figures for measles are regarded in the Review as indicating the possibility that "a new era in this disease may have opened." Stated in terms of the population at ages under 15 years, the death-rate from measles in 1921 was 206 per million, and the rate in 1920 was less than half the rate for any year prior to 1916. (To pursue this comparison another volume than the one under review needs to be consulted; the result only is stated in this volume.) For two years in alternation the death-rate from this disease has been unprecedentedly low, with a low rate between these two years. It may be hoped that increased attention to child life and the growing efforts to visit and nurse cases of this disease are beginning to show their effect.

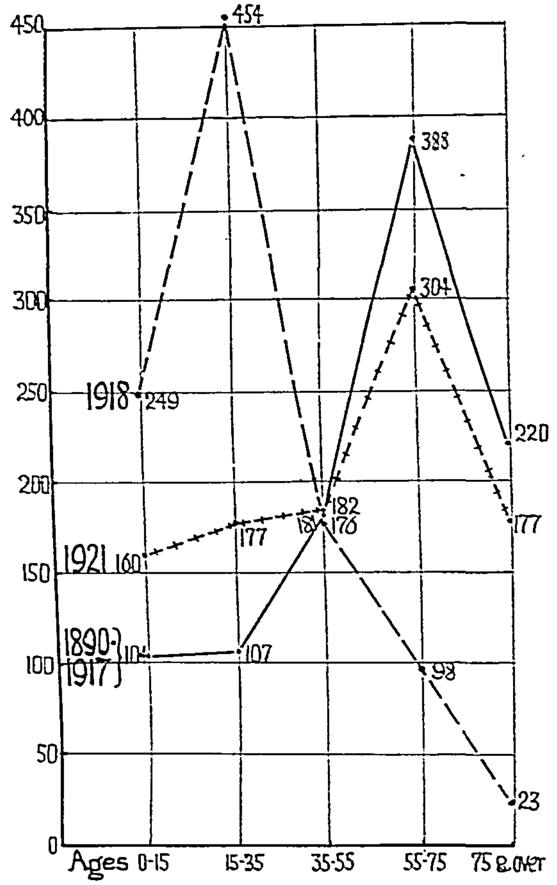
Scarlet fever has become a relatively innocent disease, so far as concerns death. In London it was prevalent three to four times as much as in rural districts, with a rather lower fatality.

Diphtheria shows much activity. From 1891–95 to 1911–15 it had declined, but this process has now ceased.

Influenza.—This disease at the outset of the great epidemic of 1918 underwent a sudden and remarkable change in the age incidence of its death-rate which has not been satisfactorily explained, and which, owing to its international distribution, can only be partially elucidated by the events of the great war. Although this cannot be discussed here, it is important to note, as shown in the following diagram, that the age distribution of influenzal mortality is steadily reverting towards the earlier type. In Fig. 1 the proportions of deaths at five periods of life are given for 1890–1917, for 1918, and for 1921, for females only, to permit of comparisons during the war, and standardised for age distribution. The extraordinary change in age incidence of mortality in 1918 is seen, and the reversion towards the earlier type in 1921.

Decline of Mortality from Tuberculosis.—This section contains the most complete review of the historical course of the death-rate from total tuberculosis, and from pulmonary and from non-pulmonary tuberculosis in this country which has hitherto been published. The death-rates from each of these forms of tuberculosis are given and the death-rates at all ages in the aggregate are standardised; in this way the differences due to varying proportions of

FIG. 1.



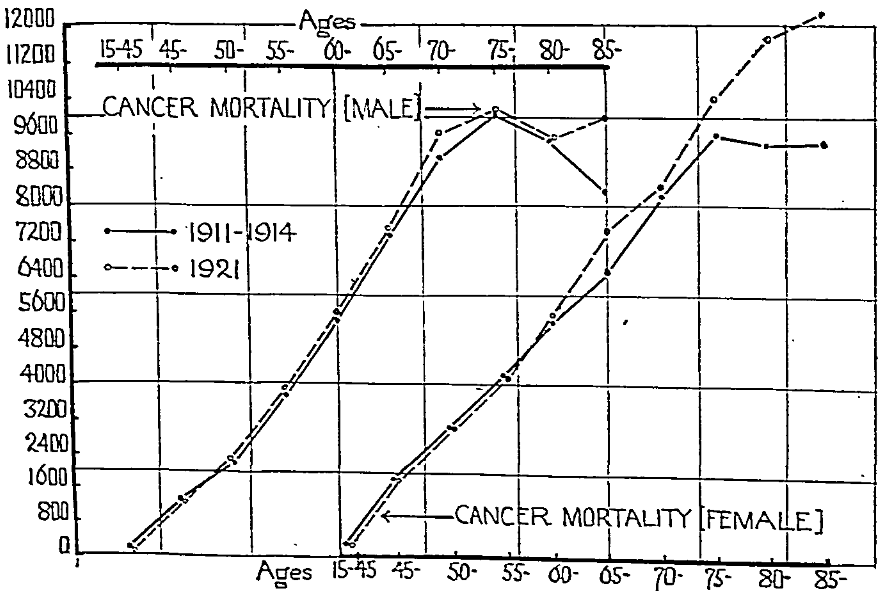
Proportions of deaths from influenza of females at five periods of life during 1890–1917, 1918, and 1921.

persons living at various ages being eliminated. Death-rates are given for each year from 1851 onwards, and summarised death-rates for decennial and for quinquennial periods. Attention was drawn in a recent issue[1] to the difficulty in interpreting statistics of various forms of non-pulmonary tuberculosis in infancy. As a large part of non-pulmonary tuberculosis occurs in infancy, the figures for pulmonary tuberculosis must be regarded as on a higher plane of certitude than those for total tuberculosis. Even for pulmonary tuberculosis in certain years there may be divergences from the usual course of events. This was to an exceptional extent the case during the great war, and following that in the great influenza epidemic of 1918–19, when the falling death-rate from pulmonary tuberculosis was replaced by an increasing death-rate which reached its maximum in 1918. The special causes for this increase and its distribution in certain special age-periods are discussed in other official reports by Dr. Stevenson. Here we are concerned solely with the general course of events, which has been resumed now that the disturbances caused by war and by influenza have disappeared.

Curves for total tuberculosis, given in the Review, show a surprisingly constant decline during the whole period 1866–1914, and this position has been resumed in 1920 and 1921. This constancy, as is pointed out in the Review, is not in the rate of fall, which has been increasing, but in the actual amount of fall. To bring out this point the course of events is charted not only for actual rates, but also on a logarithmic scale, thus enabling changes in death-rates and in rates of fall to be readily compared. With pulmonary tuberculosis the trend of events for males has been similar to that for total tuberculosis, the rate of fall having been consistently on the increase, while for pulmonary tuberculosis in females a particularly rapid fall was experienced from 1890 to 1896, while since then there has been some falling off in the rate of decline.

The decline in the death-rate from tuberculosis may be regarded as the resultant of forces, some of which tend to increase and others to reduce it, and the fact that the rate of decline has not increased so rapidly as may have been anticipated in view of the active anti-tuberculosis measures of recent years, gives ground when duly considered for encouragement. Even a stationary death-rate from tuberculosis, having regard to the increasing complexity of modern life, to the great increase of human communications, to the replacement of country by town life, to the increase of indoor and sedentary as contrasted with outdoor occupations, might reasonably be regarded as evidence that the improved hygienic habits of the people, the diminished amount of indiscriminate spitting, the improved nutrition of the population, the more successful treatment of the disease, and the hospitalisation of a large proportion of advanced and acute cases, in conjunction, are telling on the total mass of the disease. But instead of a stationary death-rate, we find that the death-rate from tuberculosis continues to decline, and so far at an increasing rate. There is every reason therefore to pursue active measures on all known lines of prevention of treatment, while welcoming any advances in therapeutics or in preventive measures

FIG. 2.



Age distribution of cancer mortality in males and females, 1911–1914 and 1921.

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[1] THE LANCET, Sept. 15th, p. 575.

that experience or scientific research may render available.

Cancer.—This disease now bulks more heavily in the death returns than tuberculosis, 46,022 deaths—20,649 of males and 25,373 of females having been returned—as cancer, as compared with 42,678 from tuberculosis—22,899 of males and 19,779 of females. In Fig. 2 is shown the course of the age distribution of cancer mortality in males and females, and it will be seen that after 45 for males and 60 for females the rates for every age-group are higher in 1921 than in 1911–14, while below these ages they are lower.

The partial shifting of the stress of cancer mortality towards the latter end of life, which remains when all fallacy caused by the greater number of survivors at these ages has been eliminated, is not peculiar to English experience. In recent returns for New Zealand, for instance, attention, we are informed, has been drawn to this change.

Among other interesting details as to the distribution of cancer, special attention should be drawn to the remarkable differences in the incidence of fatal cancer of the genital organs according to marital condition. Standardised death-rates being unavailable for this comparison, the relative excess of deaths from cancer of each genital organ over that for deaths from all causes is given, according to age, and in married and widowed women as compared with single women. There is excessive mortality among the married from uterine cancer, occurring chiefly in the reproductive period, and reaching its maximum of 210 per cent. at ages 35–40. Along with this goes the fact that the uterus is the only important seat of primary cancer mortality in which cancer does not appear to be increasing, a result which might be expected, in view of the lowered birth-rate, if injuries in childbearing have any relation to excess of cancer. On the other hand, cancer of the ovaries and Fallopian tubes shows as great a predilection for single women as uterine cancer for the married, but this excess only slowly emerges during the childbearing period. So also with mammary cancer, the excess from this form of cancer in the unmarried increases rapidly after the childbearing period. The complete significance of these important facts will be better seen when it becomes practicable in a later report to give death-rates for each age-period and for each variety of cancer. That they will be found to have much bearing on preventive medicine cannot be doubted.

The entire report calls for detailed study by all who are interested in medicine, either in its curative or its preventive side.

THE MEETING OF THE BRITISH ASSOCIATION.

SECTION OF PHYSIOLOGY.

The papers read at this section may be divided, for purposes of description, into three classes—medical, pure physiological, and theoretical. Prominence is given to the contents of the papers in accordance with this order, though a strict demarcation of subject-matter is not actually possible.

The presidential address by Prof. G. H. F. Nuttall, F.R.S., dealt with Symbiosis in Animals and Plants, and naturally attracted a large audience of botanists. The address was very broad as well as deep, and does not lend itself to abstraction, as it was developed in considerable detail.

In a paper on the Relation between Diet and Cancer, Dr. S. Monckton Copeman, F.R.S., developed a hypothesis which rests on the idea that since cancer tissue is of juvenile type, and since fat-soluble A-vitamin is more essential for the nutriment of young than of adult tissues, that reduction of the vitamin-A content of the diet might exert some differential effect on the growing tumour.

Dealing with the subject of Dental Caries at Porto Santo, Dr. Michael C. Grabham stated that the natives of this island are almost immune from caries, and suggests that this is due to some constituent of the highly mineralised water. The teeth of the district are characterised by the appearance of a thin yellow line across the upper incisors, and in later life this stain spreads and stains the teeth generally. It is, he said, not seen in Madeira.

Prof. J. M. Beattie dealt with the

Action of Finely-Divided Particles of Slate on Toxins.

The work started from the observation that workers in slate quarries did not suffer from rheumatism, although they often had bad teeth. It was an established fact that certain substances, such as asbestos, could destroy toxins *in vitro*, and extension of these experiments showed that the same property was possessed by finely-powdered slate, 2 g. of which could destroy 10 lethal doses of diphtheria toxin, if the slate was sufficiently finely divided. The action is effected in a few minutes, and the toxin is absent from the slate itself as well as from the supernatant fluid. Although other fine siliceous powders such as kieselguhr, clay or silica, can do the same thing, the presence of silica is not essential to the reaction, which can also be effected by a variety of other finely particulate substances such as charcoal, bismuth salts, &c. The use of these two last-named substances in dyspepsia is of interest, and it was suggested that by adsorbing the toxins, the bacteria were rendered inert and were more easily destroyed. Hæmagglutinin, agglutinin, and complement were also adsorbed by slate, and live bacteria mixed with slate dust were rendered non-lethal, in spite of the fact that live bacteria could still be recovered from the site of injection of the mixture. The antigenic power of serum was unaltered by slate, a fact which might perhaps find some further application, for it enables us to remove the toxic substances without destroying the antigenic properties.

Prof. H. E. Roaf described a method for

Measurement of Colour-Blindness in Terms of Wave-lengths,

which is certainly recommended by its simplicity. The subject is given a standard diagram in colours, which he is told to fill in on a blank; the diagram is then examined, together with the standard, by viewing them though coloured screens which cut off certain wave-lengths. When a match is found the deficiency of the patient's vision, as compared with the observer's. is given by the wave-lengths of light absorbed by the viewing screen which gives the match. Colour-blind subjects fell into three groups, of which the first was deficient at the red end, the second up to the sodium line of the spectrum, and the third up to the violet end—i.e., was totally colour-blind. Dr. F. W. Edridge-Green, in a paper on the effect of the blood of the retina on colour matchings, pointed out that this must be allowed for in comparing colour matchings of foveal with marginal parts of the retina.

A most ingenious recording kata-thermometer, devised for Prof. L. Hill by Dr. E. Schuster, was demonstrated by Mr. T. C. Angus. This instrument allows of a graphic record being made to show the rate of cooling in the air, and should prove very useful for the investigation of ventilation problems by the use of the kata-thermometer.

Prof. J. J. R. Macleod, of Toronto, gave a popular lecture on Insulin and its Value in Medicine,[1] which was attended by a large audience in the Picton Hall. Most of the subject-matter will be familiar to those interested in the subject, but it is worth mentioning that Prof. Macleod laid stress on two points of some current interest in connexion with recent claims. One is that there is at present no evidence that insulin can produce any of its effects when given by the mouth.

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[1] The Lancet, Sept. 22nd, p. 591.

The other point is that since we do not know the exact chemical nature of insulin, except that it is a very complicated substance, any hopes of synthesising the principle are doomed to disappointment, at least for a long while to come.

Some Pure Physiology.

Papers of pure physiological interest comprised one by Prof. H. Zwaardemaker, of Utrecht, on Bioradioactivity, or the importance of potassium and other radioactive elements in the life of the cell, and one by Prof. R. Magnus, also of Utrecht, on the effect of carbon-dioxide on the lungs; he showed that carbon-dioxide in physiological concentrations, and in presence of extremely minute amounts of adrenalin, causes dilatation of the bronchioles and pulmonary vessels, thus facilitating the inlet of air and the circulation of blood through the lungs. Prof. Ramsden and collaborators read papers, and showed very pretty demonstrations dealing with various phenomena in physical chemistry. A somewhat similar subject was dealt with in a joint discussion with the Chemistry Section on the Physical Chemistry of Membranes in Relation to Physiological Science. The discussion was opened by Prof. Roaf, who gave an account of some important phenomena in physiology in which membranes played a part, or might possibly have to be considered as playing a part.

Prof. F. G. Donnan then gave an account of the physico-chemical aspect of membranes, and expressed the opinion that much of this part of physical chemistry had only a remote bearing on physiology, because in the past it had dealt with states of thermo-dynamic equilibrium. He said that the activities, and indeed the very existence, of a living organism depend on its continuous utilisation of an environment that is not in thermo-dynamic equilibrium. A living organism is a consumer and transformer of external free energy, and environmental equilibrium means non-activity and eventual death. It was, indeed, a pleasure to hear such a distinguished physical chemist express views so broad and so sympathetic to biology, and gave one to hope that the omniscience of the physical chemist is a thing of the past generation.

Other papers of pure physiological interest were contributed by Dr. S. C. Brooks on Electrolytic Conductance of Micro-organisms; Dr. W. W. Waller on Red Blood Corpuscles under the Microscope; Prof. C. Lovatt Evans on the Contraction of Plain Muscle; Prof. Roaf on the Mechanism of the Cochlea, and on the Oxygen Content of Methæmoglobin, which he, with Buckmaster, believes to be only half that of oxyhæmoglobin; Mr. J. C. Waller on Photo-electric Currents in Leaves; Prof. J. S. Macdonald, with Dr. F. A. Duffield, papers and a demonstration on the Energy Cost of Cycling; Prof. J. S. Macdonald, with Miss Margaret Macdonald, Mr. George Macdonald, and Dr. T. W. Wadsworth, on the Physiology of Walking. There was also a paper by Mr. Watson-Jones on the Metabolism of the Frog at Different Temperatures.

The meeting was well attended, the local arrangements were excellent, and on the whole it was the best meeting of the section held since the war.

SECTION OF ANTHROPOLOGY.

In this section the presidential address by Prof. P. L. Newberry showed that in the delta of the Nile, long before Menes, the first king of Upper and Lower Egypt, there had been a contact of races from Lybia on the one hand and Asia Minor on the other, with the autochthonous predynastic peoples. From this contact arose the Egyptian civilisation. Research is proceeding which may elucidate the relative importance of the various elements. In a further paper Prof. Newberry drew attention to the importance of studying the origin of the domesticated animals and plants found in Egypt. There were evidences that the cereals came from Syria, but many weeds seemed to come from farther East. The goat was probably responsible for the disappearance of the olive by eating the shoots of young plants, while the camel, by close cropping, drove away the antelopes, and so the carnivora who preyed on them. In the discussion Prof. G. Elliot Smith suggested that barley really came from Somaliland, and indicated an infiltration of civilisation from the south rather than the north. Further research is proposed, and any evidence of the nature of weeds associated with cereal crops might be of great assistance.

Prof. Sollas, of Oxford, read a paper on the evidences of Miocene Man, derived from certain flints from the province of Cantal in France, found in deposits of Pontic age on the rocks of the Miocene and Pliocene periods. In certain cases, as for example, in the Hastings beds at the base of the Eocene, erosion of underlying formations may lead to such pressure on flint pebbles that they flake in a manner similar to that produced by human agencies, and these flakes may deceive the very elect, but in this instance the formation was such that, so far as Prof. Sollas can see, all non-human agencies can be excluded. If true, this greatly extends the history of an intelligent precursor of homo sapiens on the earth, and goes far to confirm the views of Sir Arthur Keith.

Sir Arthur Evans gave an account of his recent work at Knossos, showing the origin of a road from the palace gates which passes to the south of the island, facing Africa, so that navigators could reach Africa without passing the dangerous capes at the ends of the island. This may explain the mutual relations of Minoan and Egyptian cultures, if not even some intermingling of races.

Dr. Kruyt described a stone-using people of Central Celebes, who erected menhirs to their dead and were acquainted with bronze. They preserved the bones of the dead in pots they named "vessels," indicating a former intention and perhaps practice of sending the dead home for burial. This has a bearing on the theories of race or culture dispersal from a point on the European border.

Mr. W. E. Armstrong pointed out that on Mossel Island there was a ceremonial consumption of one or more persons on the death of a chief. Sometimes the victim offers himself voluntarily; at other times force must be used or strangers used for the purpose. There is also a peculiar form of pseudo-marriage, in which a woman, owned by several men unable individually to support a wife, is let out on hire on festive occasions for the benefit of the partners.

Mr. W. Bonser, in a study of the magic practices of the Finns, showed these people had Eastern and not Western affinities. The shaman was only able to perform after working himself up into an hysterical stage, and the office was hereditary in a few families.

Prof. Fleure reviewed the pre-history of Wales, showing the survival of ancient types, and Dr. Wheeler indicated from a study of hill forts how incomplete had been the Romanisation of the Principality.

INDIGENOUS SYSTEMS OF MEDICINE IN INDIA.

REPORT OF THE MADRAS COMMITTEE.

Our Madras correspondent has given the conclusions arrived at by a committee appointed by the Madras Government to consider the recognition of Ayurvedic medicine in the Presidency.[1] The full report, signed by all the members of the committee, is now available; it is moderately brief, but is wholly based on a very cleverly written memorandum on "The Science and the Art of Indian Medicine," prepared by Dr. Srinivasa Murti, the secretary. This memorandum is published along with the main report, and occupies 96 printed foolscap pages, as compared with the 44 pages of the report, and it will not promote the encouragement of the indigenous systems.

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[1] The Lancet, 1923, i., 1231.

Dr. Murti's Conclusions.

Dr. Murti claims to have studied the Indian systems of medicine from the two necessary standpoints, viz.: (1) as a science, and (2) as an art. To begin with his conclusions, they are: (1) The Indian systems are undoubtedly scientific, and their general principles and theories are quite rational and scientific; (2) as an art and as practised at present Indian systems are not self-sufficient, because while they are self-sufficient and efficient in medicine, in surgery they are not.

Six long chapters, some of which contain much irrelevant matter, follow, viz.: (1) Scientific methodology; (2) subjects of preliminary scientific study—the panchabhuta theory; (3) physiology and anatomy—the thri-dhatu theory; (4) ætiology and pathology—the thri-dosha theory; (5) diagnosis and treatment—the rasa-guna-veerya-vipaka-prabhava pharmacology; and (6) Indian systems judged from the standpoint of art.

Science and Mysticism.

It is clear that Dr. Murti depends far too much on the opinions of European "authorities," who would be more correctly called "cranks" in European scientific circles. The line of thought appears in this sentence: "Every system of Hindu thought is at once philosophy, science, and religion, all in one, and one in all." It is always urged against criticism of Ayurvedism that the critic must first learn Sanskrit, then study Ayurveda for several years, and become imbued with the spirit of Hindu philosophy before he can deliver any judgments. If the upholders of Western medicine agreed to this, Ayurvedism would stand practically unassailable. If the professors of Ayurveda intend to incorporate mystic rites with religious ceremonies and Vedic texts, and to maintain that the outcome is a system of medicine, they must remain a cult apart. Dr. Murti's statement that "it is quite as scientific for Ayurvedists to assume the truths of Samkhya and the like as it is for the student of Western medicine to assume the truth of modern physics and chemistry," traverses too much accepted knowledge to make communion possible.

In the chapter on "Preliminary Scientific Study in Ayurveda" an attempt is made to prove that European and Hindu theories of matter are in very close agreement, and that the modern conception of the atom finds its parallel in Hindu scientific thought from the commencement. It is also stated that the original propounders of such theories as that of the evolution of the atoms were persons endowed with immense ranges of vision, because the old Hindu gurus or teachers, "by improving their own internal organs of sense," could extend their range of perception to any desired degree, even to perception of an atom. The microscope and other scientific instruments cannot be thus set aside.

Ayurvedic "Humoral" Theory.

In the chapter on physiology and anatomy further attempts are made to show that modern physiology is gradually coming round to the ancient "humoral" Ayurvedic theory, and that "hormones" and "enzymes" are merely new words for "special chemical complexes," which were thoroughly understood and worked out by the ancient physicians of the indigenous systems. But the mysterious "humours," called Vata, Pittha, and Kapha, must pass through modern physiological laboratories before it can be claimed that these "dhatu-triads" correspond exactly to the catalysts, enzymes, hormones, and other activating agencies of modern Western physiology. Dr. Murti, enthusiastic as he is, seems to hesitate before making the claim, and merely pleads for an understanding study of the ancient Ayurvedic physiology. In anatomy it is admitted the loss has been very heavy, all original works having been lost, and later writers did great harm to Ayurvedic literature by burdening their writings with a "fanciful anatomy" of their own invention.

The chapter on ætiology and pathology is written in the same frame of mind. It is stated that Ayurvedists hold that the only ways in which the body could be invaded are through the mind and senses; hence the subjective Ayurvedic classification of causes of disease is complete and comprehensive, whilst that of modern medicine, which states that invasion of the body is carried out by external agencies of disease, is only objective and therefore imperfect. As regards the bacterial causes of disease, the memorandum goes rampant, quoting, for instance, Sir James Goodhart's Harveian oration for 1912, "even bacteria are probably results and not causes," and pleading that the Ayurvedic thri-dhatu (humoral) theory is what modern research is being driven to recognise, and that there seems to be an essential similarity, if not identity, between the two modes of thought.

Indian Methods of Diagnosis.

Ayurvedic diagnosis of disease is carried out by means of the five senses and by interrogation, whilst examination of pulse and urine have received considerable attention. Some Ayurvedic practitioners even claim that sex, pregnancy, &c., can be diagnosed by examination of the urine, and this claim is supported by the assertion that "if it is possible to diagnose pregnancy by the presence in the blood of an enzyme capable of digesting placental proteins, why should it be impossible to diagnose the same by an examination of the urine?" The method of examination to be adopted is not mentioned, but in any case the above quotation is an illuminating sidelight on the attitude adopted by Dr. Murti, himself trained and qualified in Western medicine.

In the section on treatment it is stated that Western-trained medical men often failed because they did not possess the key to the diagnosis of the *patient*, though they were quite correct in their diagnosis of *disease*. Western medicine apparently has no means of recognising a patient's *prakriti*, or inherited constitution, but acts more or less blindly, and learns from the bitter experience of its patients. Why this prejudiced assertion is made without any proof is not stated, but it again illustrates the writer's mentality. Dr. Murti adds that the category of thadarthakari remedies (a series which produce the same condition as the cause of the disease itself) is wide enough to include all forms of vaccine therapy known to Western medicine. Hence, it is presumed, the promiscuous and dangerous use made in India to-day of all kinds of serums and vaccines! Dr. Murti admits that Ayurvedic diagnostic methods are mostly clinical in contra-distinction to the laboratory methods of Western medicine, but ends by pleading for "a harmonious and judicious combination" of the two. It is impossible to follow him when he maintains that it would be dangerous and even disastrous for a Western medical man to use Ayurvedic remedial measures without an understanding of the principles of Ayurvedic pathology. There can surely be only one scientific system of pathology. Again, the statement is made that "various kinds of vaccines are made from fæces, urine, expectoration, and foul matter from pathological secretions and excretions of various kinds." This statement is used to ridicule the British Pharmacopœia, but Ayurvedists themselves give crushed gall-stones as a medicine and have been known also to prescribe "fresh urea" in the form of cow urine.

Self-sufficiency of Ayurveda.

Finally, under the heading "Is Ayurveda self-sufficient at present?" it is admitted that it is necessary to utilise the services of the Western system in the branches of medicine, surgery, midwifery, ophthalmology, medical jurisprudence, bacteriology, and anatomy; and the stethoscope, the microtome, the X rays, polygraphy, the electroradiograph, the cystoscope, &c., are all to be made use of, as is electrical or radium therapy, quinine, emetine, and antimony. "It cannot be that water is H_2O in the west and something else in the east." This fatal admission, made by Dr. Murti, refutes all the laborious arguments he has made, for if water is H_2O in both east and west, can scientific pathology and physiology differ in the two hemispheres? At present the Ayurvedists admit they have neither teachers nor text-books with which one would expect them to place their system of medicine on a scientific footing. This note cannot be concluded in any better way than by quoting another sentence from the memorandum: "In so far as the one common ideal of all systems of medicine is the preservation of health and the prevention or cure of ill-health, there can really be but one system of medicine"; but that this is not a widely-accepted opinion among Ayurvedists appears from a recent letter to the press from an Ayurvedic physician, who states that "absolute fusion can never be achieved, for Ayurveda will never consent to lose its characteristic of thinking in terms of its own peculiar religious philosophy of Satwa Rajas and Tamas."

No Hope of Fusion.

There can be no hope of fusion with modern scientific advance so long as this opinion is held. The same writer tries to answer the argument that the Government cannot be asked to place the Ayurvedic systems on a definite footing until they have put themselves in a position which can be recognised as a body and a teaching profession, by pleading that the present obnoxious rite of vaccination could never have survived against the attacks of very able exponents of Western medicine unless it had been bolstered up by Government. This is the level of argument used, and the ignorance displayed, by one of the ablest exponents of the Ayurvedic systems. No Government recognition should be given until the Ayurvedists are prepared to come out into the open, to produce a syllabus for teaching, and to state their methods for the treatment of diseases, so that the scientific world may have some definite proposition to work upon.

INSULIN MEDICATION:

A COMPENDIUM OF EXPERIENCES.

RECENT issues of the *Journal of Metabolic Research* contain numerous papers by different workers in Canada and U.S.A. who have all been working at the treatment of diabetes mellitus with insulin. Vol. II., Nos. 5 and 6, though dated November and December, 1922, contain papers which were received for publication as late as May, 1923; this makes for some confusion. All the workers agree as to the great value of insulin, but they differ widely as to the best method of using it. They may be divided into two schools just as the English workers are—those who aim at keeping the blood-sugar normal, and those who pay most attention to the clinical condition and do not mind if the blood-sugar is raised. F. G. Banting, W. R. Campbell and A. A. Fletcher, and F. M. Allen and J. W. Sherrill agree that the fasting value of the blood-sugar should be kept as near normal as possible. E. P. Joslin, R. M. Wilder, J. R. Williams, R. Fitz, H. Geyelin, R. T. Woodyat, and their co-workers all seem to agree that the clinical condition comes first and that the blood-sugar is a secondary matter.

The manner in which the diet has been arranged also differs considerably. Most workers have been using a diet arranged according to Woodyat and Shaffer's principles of the aketogenic ratio and to the basal metabolism. Allen has been using the latest modification of his method which differs considerably from the original method which is still in use in this country. The end-stages of his two plans do not differ very much from each other. The actual amount of carbohydrate which has been given by the different workers has varied, considerably. The dosage likewise has been varied, and it has been necessary in most cases to give two or three doses in the day before the meals at which carbohydrates have been eaten. The following special points demand attention.

Recovery of Tolerance.

Banting, Campbell, and Fletcher point out that recovery of tolerance occurs in some cases, which render the work of estimating how many grammes of carbohydrate are looked after by 1 unit of insulin quite misleading. Especially good results are reported with three children; in one case the blood-sugar was kept at the normal level, but in the third there was no increase in sugar tolerance, although the child had nearly doubled her weight. They lay stress on the fact that while the diet may be increased to any desired amount provided sufficient insulin is given and the patient kept aglycosuric the proper balance of protein-fat and carbohydrate cannot be neglected; also, that rest for a weakened organ is a fundamental principle of therapeutics, and that efficient rest may be achieved by the use of insulin and thus give a chance of recovery of sugar tolerance. Patients with septic conditions can take big doses of insulin without showing the signs of hypoglycæmia.

Diabetic Coma.

The treatment of diabetic coma is specially dealt with by Campbell, who comments on the whole question of ketosis. He believes that large quantities of sugar should be given to patients in coma together with large doses of insulin in order to ensure that hypoglycæmia does not occur. The results of such treatment in his hands have been very satisfactory. Fletcher and Campbell have a separate paper on hypoglycæmia and its complications. They found that the level of blood-sugar at which symptoms occurred varied in different persons. Some patients had symptoms when the blood-sugar was only 0·08 per cent., whereas others could tolerate a blood-sugar of 0·06 per cent. without any inconvenience. A good account of the symptoms of hypoglycæmia is given. The first symptom is often nervousness followed by excessive hunger or inertia. This is followed by sweating and pallor, and in children the pulse rate is increased. At a later stage tremor is present and there is a loss of the fine movements of the hands. Aphasia, both motor and sensory, may occur together with great excitement. Syncope may occur and the patients may become unconscious, but no patient has been observed in convulsions. The clinical picture is sufficiently alarming but the symptoms can be relieved very easily. Sugar will at once stop them, but orange-juice and hot tea or coffee will also relieve the subjective symptoms. In emergency a dose of adrenalin, 10 or 15 minims, seems to work instantaneously, but should be followed by a little sugar.

Wise and Foolish Patients.

E. P. Joslin, H. Gray, and H. F. Root report good results with 87 patients, and they emphasise the point that insulin is a remedy for the wise patient and not for the foolish one. The patients usually gained weight under treatment, and they raise the question whether this gain in weight is a sign of any recuperation of the pancreas. The results were equally good whatever the age of the patient. One girl, aged 12, who had only been ill 32 days made a rapid recovery. She had a normal fasting blood-sugar with only 3 units of insulin a day and was able to eat 155 g. carbohydrate. Joslin does not accept the view that the fasting blood-sugar must be brought down to normal at all hazards. He gives an excellent list of rules for patients, and one of the most important is "If your supply of insulin fails reduce your diet by one-third."

The Effects of Dextrose and Lævulose.

R. M. Wilder, W. M. Boothby, C. J. Barborka, H. D. Kitchen, and S. F. Adams report good results with 40 cases treated with insulin. As the insulin in the early stages was irregular in potency a scheme for its standardisation on patients was worked out. They found that if the protein of the diet was increased up to 3 g. per kilo, keeping the caloric and carbohydrate value of the diet constant, the insulin had less effect. Insulin would rapidly cause a patient who was losing nitrogen to gain nitrogen. They do not consider it essential to bring down the blood-sugar to normal.

The basal metabolic rate was unaffected by insulin. Experiments were made with equal amounts of dextrose and lævulose with and without insulin. Lævulose caused a small rise in the respiratory quotient (R.Q.), even when no insulin was given, while after insulin, although both caused an increase, that produced by lævulose was much greater. The specific dynamic action of the two sugars was equal, but the blood-sugar was less raised after lævulose. The authors suggest that the insulin brings the sugar into a reactive form which is more available for oxidation and polymerisation. Further, that it is the position of the C.O. group in lævulose which is responsible for the latter sugar being better used than dextrose. J. R. Williams reports the results of four cases, one of which was very severe. The results were very striking, but there was no sign of any recovery. He advises 2–3 injections a day as being less likely to cause severe reactions. He is doubtful whether the dose of insulin will not have to be increased. He also considers that the blood-sugar should be kept higher than is customary when no insulin is given. R. Fitz, W. P. Murphy, and S. B. Grant report observations on the R.Q. before and after insulin. They found that it rises considerably as the result of the insulin and does not fall again until some days after the insulin has been discontinued. The effect of insulin in bringing the patients into nitrogen equilibrium is very striking. The fasting value of the blood-sugar was above normal in their cases. H. Geyelin, G. Rawle-Harrop, M. F. Murray, and E. Corwin reproduced photographs of three children before and after treatment with insulin.[1] They show the striking improvement which takes place when sufficient food is given. The children all had high blood-sugars and passed sugar before the insulin injections. R. T. Woodyat thinks that it is better to give only one dose in the day. He does not consider that it is essential to aim at bringing the fasting blood-sugar down to normal. One profoundly under-nourished man developed hypoglycæmia after insulin, and although he was given sugar and had hyperglycæmia he did not regain consciousness.

Observations on 161 Patients.

F. M. Allen and J. W. Sherril publish a long account of their work on 161 patients, many of whom had been under observation for a long time. They have been treated on the lines familiar to those who know Allen's work. Certain facts stand out among the mass of detail. Allen believes that the aim of the physician should be so to use the insulin that the fasting blood-sugar should be normal. He gave three instances in which patients were treated on different lines, and shows the dangers of discontinuing the insulin suddenly. The three patients all became ill, but the symptoms of coma were very anomalous and would not have been detected unless the blood had been examined for sugar and acetone bodies. The authors do not think that it is possible in every case to bring the blood-sugar down to normal. Two of their conclusions deserve especial mention. "Insulin has tremendously improved diabetic treatment, but has not simplified it." Again, "Insulin . . . cannot atone for lax or inaccurate dietary methods."

A Defence of the Principle of Undernutrition.

In the first number of vol. iii. of the same journal J. W. Sherril continues the account of the work done in Allen's laboratory with a paper on the influence of carbohydrate and protein on diabetes and the insulin requirement. The diets of the patients were very carefully controlled and were changed in order to bring out special points. He concluded that carbohydrate had a stronger glycosuric effect, and required more insulin than any other kind of food when it was given in equal caloric value. Protein required much less insulin than carbohydrate when it was substituted for carbohydrate either in equal caloric equivalents or in equal carbohydrate content. It was also much less efficacious in the treatment of hypoglycæmia. Some of these results are rather surprising as it had been thought that the specific dynamic action of protein gave it special glycosuric properties. Sherril also concluded that there was no constant relation between insulin dosage and the carbohydrate intake, as it depended very largely on the caloric value of the diet. Allen discusses the influence of fat and total calories on diabetes and the insulin requirement. He opens with a long and able defence of the principle of undernutrition, and attacks the work of his critics, especially Woodyat, Newburgh, and Marsh. Numerous tables are given of diet experiments with insulin. An attempt was made to assess the total insulin requirements of a small girl of 3 years old. This child could only tolerate 100 calories without passing sugar, but with 3 units of insulin 400 calories were tolerated. It is suggested that her initial insulin production was about 1 unit and that she therefore needed 4 units altogether for that amount of food. The evil effects of a great increase in the body-weight due to a great increase in the caloric value are pointed out. In one case the dose of insulin was very large and had to be increased. When the diet was reduced the weight decreased and the dose of insulin could also be diminished. The effect of these facts is that the clinical condition is no longer a guide to the real condition of the patient being treated with insulin. Allen concludes that the principles on which the undernutrition treatment were built have been proved correct by his experiments with insulin. C. H. Best and D. A. Scott had been exploring the possible sources of insulin, and, stimulated in their search by the publication of Winter and Smith's work on the presence of an insulin-like substance in yeast, have been able to demonstrate a substance which lowers the blood-sugar of rabbits in potatoes, rice, wheat, beet-roots, and celery. Working with Banting they have also demonstrated an insulin-like substance in the blood of the ox, dog, rabbit, and man.

Results from Switzerland and Germany.

The *Schweizerische Medizinische Wochenschrift* dated August 30th contains two articles on insulin. Prof. H. Sahli, of Bern, gives a good account of the early work on the search for the internal secretion of the pancreas, paying special attention to that of Zülzer. The latter undoubtedly showed in 1907 that a pancreatic extract had considerable influence on the urine sugar of diabetic animals and patients, but the local symptoms following the injection were so unpleasant that the discovery attracted little attention, and was soon forgotten. Prof. Sahli proceeds to describe the physiological properties of insulin and its effects on patients with diabetes mellitus. He lays especial stress on the importance of combining the use of insulin with the usual dietetic treatment. He gives an account of the method which he has employed for mild and severe cases. If determination of the blood-sugar cannot be made, he thinks it is safer to allow the patient to excrete a little sugar, although he admits that this is not the ideal treatment. He also expresses the opinion that insulin is only a symptomatic treatment, and has no real healing process. But a vicious circle can be broken by its use, and in this sense it has a certain degree of curative value. Dr. M. Guggenheim, of Basel, also gives a good account of the past and present uses in discovering insulin, and of its physiological action and clinical effects. He considers that the amount of food and the dose of insulin should be so chosen that the fasting blood-sugar is within normal limits. A very large number of references is given.

In the *Deutsche Medizinische Wochenschrift*, of August 17th, Prof. W. Ercklentz gives an account of his treatment of six patients with insulin. The clinical results were very good. He also states that if blood-sugar determination cannot be made it is better to allow the patients to pass a little sugar. In the same journal (August 24th) Prof. O. Minkowski, who with von Mering was responsible for the original extirpation experiments on the pancreas, expresses his satisfaction with the properties of insulin. He gives an interesting account of the hindrance to the introduction of insulin into practice in Germany at the present time owing to the difficulties with the exchange and the bad financial conditions.

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[1] See a similar striking case, THE LANCET, 1923, i., 1277.

Standardisation of Insulin.

In "Public Health Reports" (August 3rd) Prof. Carl Voegtlin and Edith R. Dunn describe the difficulties of standardising insulin. They have used albino rats instead of rabbits, as being less expensive. The rats are kept on a constant diet. It was found necessary to keep the temperature of the chamber constant, as the rats were much more easily killed at a temperature of 28° to 30° C. than between 15° and 22° C.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH

THE following table gives some of the principal health statistics of a group of counties for 1922 :—

Name of county.	Estimated population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality: Legit.	Infant mortality: Illegit.	Maternal mort. from childbirth.
Northamptonshire.. ..	213,340	18·1	11·7	0·9	1·4	1·8	58	77	5·2
Warwickshire..	348,003	21·2	11·0	0·8	1·0	2·2	(60)		5·0
Cambridgeshire	129,591	18·3	12·7	0·9	1·6	—	59	65	3·3
Cumberland ..	218,499	22·3	14·7	0·9	1·3	3·1	99	117	5·1
East Suffolk ..	207,424	19·5	12·6	1·1	—	—	(64)		—
West Suffolk ..	109,406	18·6	13·6	1·0	1·7	2·3	(55)		3·4
Fife	112,384 (extra-burghal)	22·4	12·6	0·8	1·1	2·5	(99)		6·0

The bracketed figures give the total infant mortality.
Lines indicate that the information was not given in the report.

Northamptonshire.

Dr. Charles E. Paget reports that a special subcommittee of the county council is considering the coördination of health services but had not finished its deliberations at the end of the year. A move has been made in the direction of having a single small-pox hospital for some of the northern county districts. The Rushden House Sanatorium was opened in the fourth quarter of 1921 for early, middle, and advanced cases of pulmonary tuberculosis. The 50 beds retained for men, women, and children from the county remained full during 1922, but the 18 beds set aside for private patients and other authorities were not so utilised. Two of the latter were used for spinal cases, pending the provision for such cases at the Shropshire Orthopædic Hospital at Oswestry. Some progress has been made in the improvement of water-supplies, but the long delayed scheme for Thrapston is still only under consideration. Housing schemes have provided 530 new houses in 19 out of the 28 districts and private enterprise 90 new houses in 21 districts; but house shortage is acute in the Raunds, Rushden, Desborough, Irthlingborough, and Kettering urban districts and in the borough of Daventry. The veterinary inspection of cattle is proceeding satisfactorily in certain districts, and Dr. Paget hopes it will soon become general in the county. The public analyst reports that 19 of 335 milk samples were below the standard and 8 out of 47 samples of skimmed milk. In one milk 60 per cent. of the fat had been abstracted and in two cases 30 per cent. and 40 per cent. respectively of water had been added.

Dr. Lila S. Greig, in her maternity and child welfare report, shows that 51 per cent. of the births are attended by midwives. She points out the need that the doctor called in to a suspected septic case should give prompt instructions to the midwife. The midwives have been supplied with collosol argentum, but this practice is to be discontinued. It is not thought that the incidence or severity of ophthalmia neonatorum has been diminished by the use of collosol argentum and it has been used by midwives in some cases for treatment, causing a delay in notification. Out of 20 notifications, the sight of the left eye was lost in one case and in another the result is not known, these two cases being in doctors' practices. The other notified cases made a good recovery. Dr. Greig mentions that among the notifications required of the midwives that with regard to artificial feeding is the most neglected. Out of 74 infants reported by the midwives at the end of the year to be artificially fed, only 28 had been notified by them at the proper time. The percentage of breast feeding reached 73·7 per cent. in 1919 but has since declined and was 65·5 per cent. in 1922. Health visiting in the Brackley area is carried out by the Northamptonshire District Nursing Association. Up to September this work was supervised by Dr. Greig, but from that date till the end of the agreement the special subcommittee, mentioned at the outset, has arranged for the work to be supervised by the superintendent of nurses. A report will be furnished to the subcommittee at the end of the period covered by the agreement.

Warwickshire.

Dr. A. Hamilton Wood deals with the pollution of the Rivers Tame, Anker, and Avon. The Tame is already polluted by the Black Country towns before it reaches Warwickshire and steps are being taken to minimise this. Inside the county the Birmingham, Tame, and Rea Drainage Board are carrying out experiments and improvements. As regards the Anker, the Nuneaton Council has converted old contact beds into percolating filters to keep back the excess of suspended matter appearing in their effluent and propose to lay down additional circular filter beds. It is hoped, too, that a satisfactory method has been decided upon for dealing with the long existing nuisance from the trade waste of the Sketchley Dye Works. The Avon is chiefly polluted by Rugby and Coventry. Rugby needs an extension of its filters but their proposed scheme has been restricted by the Ministry. Coventry has been experimenting for two years with bio-aeration (the method worked out at Sheffield), and proposes to apply this method to a daily flow of 3 million gallons at present imperfectly treated by irrigation. The new scheme of the Ministry of Pensions for the vocational training of ex-Service men suffering from tuberculosis is mentioned and it is pointed out that there is apparently insufficient accommodation at the training centres. In Warwickshire 17 men were examined in the summer of 1922, and six were passed as clinically suitable. Of these six, four were still waiting for vacancies in January, 1923.

Dr. Wood complains of the incomplete notification of births and suggests that it may be partly due to deliveries being conducted by handywomen who are afraid to notify. Of 7373 births, 505 were not notified. The mortality from puerperal fever was the highest ever recorded in the county. Dr. Wood also refers to the large number of still-births and does not see much likelihood of improvement till the practice of midwifery is given a higher place. In view of the many problems worthy of careful study which confront the accoucheur and the fact that midwifery deals with the ante-natal, natal, and post-natal states, he thinks that midwifery should rank in importance with other specialised branches of medicine "and not be left in the haphazard hands of the rank and file of the profession." The excellent system of voluntary infant welfare centres run in coöperation with the county council's scheme continues to develop. There are now 29 centres throughout the county. Three new centres were organised during the year, in spite of the fact that no grant from the Ministry is available for this extension; they are financed entirely by voluntary funds. The amount available for free milk has been made to go further by limiting the amount granted to each household (except in the case of bottle-fed twins) to one pint of fresh milk daily or three packets of dried milk fortnightly. Dr. Wood thinks notification of ophthalmia *neonatorum* should be made direct to the county medical officer of health, but he is in the happy position of recording that of 59 notified cases of this disease, all recovered with vision unimpaired.

Cambridgeshire.

Dr. Frank Robinson's report shows that much attention is given to the question of the midwifery and nursing service both in the county and borough of Cambridge. Through the agency of the County Nursing Association the number of trained midwives has increased since 1916 from 24 to 50. There are now only four untrained midwives. All the trained midwives practising in rural areas are also district nurses. During 1922 three grants were made to the County Nursing Association for the training of nurse-midwives who have to undertake to practice for three years in the county after becoming qualified. Through the County Association three new district nursing associations covering ten parishes were started during the year. Grants are also made by the county council towards the expenses of some of these district associations in employing nurse-midwives. Since the passing of the Midwives Act, 1918, the proportion of cases in which the midwives summon medical aid has gone up from 5·2 per cent. in 1919 to 7·2 and 7·1 per cent. respectively in 1921 and 1922. Of the 152 cases in which a doctor was called in during 1922, the county council paid the fee in 102 cases but, wherever possible, the fee is recovered from the patient in whole or in part. The borough has its own maternity and child welfare scheme, and under this scheme 139 expectant or nursing mothers received dental treatment, of whom 58 were provided with artificial dentures, one condition being that they agree to their children receiving dental treatment both up to 5 years of age and during the whole of their school life. Some progress has been made in housing matters, but Dr. Robinson estimates that some 600 or 700 new houses are still required in the county, apart from new houses needed to replace worn-out property. The severe drought of 1921 stimulated the provision of schemes of water-supply, and progress in this direction is reported.

Cumberland.

Dr. F. H. Morison is inclined to attribute the great increase in infant mortality to unemployment and the resulting inadequacy, especially as regards vitamins, of the diet of a large section of the community. The districts which showed the highest rates were those where there was most distress—viz., Cleaton Moor, 166; Whitehaven, 160; Workington, 127; and Egremont, 121. Dr. Morison returns to the food question in speaking of the prevention of tuberculosis, and expresses his belief that education of the community in food values would constitute one of the most valuable public health campaigns. He thinks we should do as is done in the case of quack medicines and proprietary articles—i.e., we should repeat our teaching until everyone is convinced that what is repeated so often must be true. He thinks the two most hopeful methods of dealing with tuberculosis are segregation of advanced cases and raising the resistance of those who are most susceptible, such as contacts, debilitated, and so-called pre-tuberculous children. He suggests that the Industrial School at Cockermouth, at present disused, might be used with the latter object as a preventorium for debilitated children. Returning to the subject of the high infant mortality rate, Dr. Morison points out that "at the present time there are no maternity and child welfare centres in the county with the exception of the one at Wigton, which is worked by the Wigton District Nursing Association."

The medical superintendent of the Englethwaite Industrial Colony for Consumptives, Dr. Mark S. Fraser, reports that of 79 men who received treatment and training and left during the last three years 23 are earning their living. Of the 23, 16 are in receipt of a modified pension and it is impossible to say if they would be able to maintain their families without this subsidy. Eleven of the 23 are working at trades learned at the colony. Dr. Fraser has seen most of them and finds that their health and working capacity are not nearly so good as those of the seven ex-colonists who are employed at Englethwaite. In consequence letters have been addressed to the sanitary authorities concerned asking them to establish after-care committees to befriend ex-colonists belonging to their own areas.

East Suffolk.

Dr. G. I. T. Stewart points out that for railway and other reasons the problem of locomotion is a difficult one in East Suffolk, and that the formation of combined districts with whole-time medical officers is not easy. Hospital accommodation is "lamentably deficient," and for this coöperation is the remedy. Dr. Stewart suggests a scheme for four areas based on an adequate motor ambulance service: (1) southern area—hospital at Ipswich and Felixstowe; (2) north-western area—hospital at Stowmarket (West Suffolk to be asked to join); (3) north-eastern area—hospital at Lowestoft; (4) central area—to be provided for by a county hospital at Saxmundham. The V.D. work is done at Ipswich and Norwich, but a clinic is needed at Lowestoft. The inspection of midwives is carried out by the superintendent of the Suffolk County Nursing Association. Lowestoft has its own child welfare scheme. Otherwise there is little to record in the way of "centre" work. There are three one-day-per-week centres at Aldeburgh, Beccles, and Stowmarket with average attendance of 6, 15, and 17 respectively, and centres started at Felixstowe, Leiston, and Wickham Market have closed down owing to lack of interest.

West Suffolk.

Dr. A. H. Bygott reports that the proposal to form the sanitary areas of the county into two combined districts, each with its whole-time medical officer of health, has been rejected by a meeting of representatives. An alternative was the adoption of the Essex system, but only four of the district medical officers of health hold the diploma of public health. The Bury St. Edmunds administrative bodies have expressed dissatisfaction that more is not done for advanced cases of tuberculosis. Dr. Bygott points out that one cannot establish "homes for the dying," that the county sanatorium has raised its beds to the maximum, and that the fever hospitals in the county are not suitable for the purpose. The county council were prepared to take over the infirmary of the Bury St. Edmunds guardians. The Ministry of Health suggested the Mildenhall Workhouse, but its inaccessibility and the cost of adaptation and administration ruled it out. A more effectual remedy, says Dr. Bygott, is for the county and county borough councils to take over the treatment of the sick from the boards of guardians.

Fife.

Dr. G. Pratt Yule says measles, whooping-cough, and respiratory disease have played their part in the increased infantile mortality of 1922, and refers to overcrowding as the determining factor in the fatality of these diseases. In some areas housing schemes, aided by emigrations to the Colonies and U.S.A., have relieved the situation, but among the more busy mining communities there is much subletting which is tantamount to overcrowding. A large shelter has been fitted up with 16 cots for the treatment of surgical tuberculosis in children at the Glenlomond Sanatorium. Cases of pulmonary tuberculosis are being reported earlier, and male cases are accepting institutional treatment at an earlier and more hopeful stage.

Dr. Yule refers to the "handywoman" difficulty. Not infrequently, he says, unqualified women appear to be the sole attendants at confinements, but when investigation takes place there emerges "the shadowy supervision of a medical practitioner." Dr. Yule has written to the C.M.B. for Scotland for guidance as to what constitutes "direction" on the part of a medical practitioner, but so far no light has been forthcoming. He mentions that the Royal Sanitary Institute and the County Councils' Association have approached the C.M.B. for England on the same point, and that the English Board are of opinion that "under the direction of" means "in the presence and under the direction of" and further, that they (the English Board) intend to take the earliest opportunity of pressing for an amendment of the subsection of the Act dealing with the matter which will remove the words "habitually and for gain"—words which render the subsection futile at present.

Correspondence.

"Audi alteram partem."

CANCER AND DIET.

To the Editor of THE LANCET.

SIR,—Your leading article under the above title in THE LANCET for last week obviously necessitates a reply from me.

Needless to say, no one can regret more than I myself the "flamboyant" and unwarranted statements that appeared in a certain section of the public press in reference to my paper in the Physiological Section at the recent meeting of the British Association. And I specially regret that your criticism of my communication should have been based on unsatisfactory reports. Rationing in this country during the last year of the war was fairly stringent, in the large towns at any rate, this stringency having been specially marked as regards those foodstuffs which, as you state, provide the main part of the fat-soluble vitamin A in a normal dietary. And yet, except as regards tuberculosis, there is, so far as I am aware, little evidence that the public health was adversely affected; while, as indicated by the Registrar-General's statistics, the cancer mortality for both sexes, especially in London, was slightly though definitely diminished. In the case of the Central European States to which you allude additional factors came into operation.

My own investigation as to the results of a dietary deficient in the fat-soluble A factor but sufficient (and this is the important point) in every other respect, while at the same time varied and appetising in character, has now extended over a considerable period,[1] and has included an experience of it in my own person lasting for nearly a couple of years. During this time I was necessarily engaged in a certain amount of physical as well as mental work. Yet it was not until the end of that period that I experienced any noticeable ill-effect as the result of the experiment—a skin affection of the palms of both hands which readily cleared up on the addition to my dietary of uncooked vegetable food in the form of salads. And Dr. Wyard,[2] reporting on our investigation at the Cancer Hospital, which you quote, stated in reference to patients on this dietary that "In no case was any unfavourable change in the general condition of the patient attributable to the diet, and in many improvement was definite, at least at first." The medical superintendents of several infirmaries in which patients have also been under treatment have reported to the like effect. The suggestion that I have overlooked the literature of the subject, and, more particularly, the work of Prof. J. C. Drummond, is hardly borne out by the fact that in my paper I specifically referred to his investigations and, as regards the growth of tumours, stated that I was in general agreement with his views.

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As regards the final paragraph, I may perhaps be permitted to state that a few months ago I submitted to a meeting held in the laboratories of the Imperial Cancer Research Fund, under the chairmanship of Dr. Murray the Director, a communication practically identical in terms with my Liverpool address. This meeting, at which Dr. Wyard was also present, afforded opportunity for helpful criticism. The dietary in question has been gradually evolved as the outcome of consultations with Prof. Gowland Hopkins and other bio-chemists; of experiments on myself, and, with their consent, on other private individuals, and of patients in various public institutions; as also of a comparative study (not yet completed) of the dietaries and vital statistics of certain "enclosed" and "unenclosed" religious communities in this country and abroad.

It is, I think, unnecessary to comment on the assumption with which the article concludes.

I am, Sir, yours faithfully,

Sept. 24th, 1923. S. MONCKTON COPEMAN.

PROBABILITY AND EXTRASENSORIAL CHANNELS OF KNOWLEDGE.

To the Editor of THE LANCET.

SIR,—In his address on Extrasensorial Channels of Knowledge (THE LANCET, Sept. 8th), Prof. Charles Richet brings forward evidence which, in his opinion, establishes the truth of "knowledge of reality obtained by other means than by the ordinary channels of the senses." Some of this evidence is of the following character. A dreams that B, of whose movements he can have no direct means of information, has died, and, in fact, B *has* died. To the retort of the man in the street that this is a mere coincidence, Prof. Richet replies: "Chance is, indeed, a very convenient god, to which we can always appeal. But why should we introduce these extremely small probabilities into our calculations? Practically we never come across a probability of 1 to a 100 million, and yet this is the figure at which one must assess the probability of Wingfield having once in the course of his life a single hallucination, and that just the hallucination of his brother being killed at the same moment. Chance will evidently not explain these occurrences." I do not know how it is possible to assess the arithmetical value of the probability in Wingfield's case, since I have no knowledge of the frequency or contents of this gentleman's dreams, save in one instance, but the man in the street would surely *rejoin* that, far from never coming across probabilities of 1 in 100 millions, he meets them almost every evening. The probability that the dealer at bridge will distribute the 52 cards in any assigned order is measured by a fraction which has more than 60 zeros after the decimal point before we reach a significant figure, it is the reciprocal of the continued product of 52 × 51 × 50, &c. Events, the probability of which is so immensely less than Prof. Richet's 1 in 100 millions, happen regularly wherever four bridge players are gathered together. Evidently there is something wrong. The philosophy of the new centres were organised during the year, in spite of the fact that no grant from the Ministry is available for this extension; they are financed entirely by voluntary funds. The amount available for free milk has been made to go further by limiting the amount granted to each household (except in the case of bottle-fed twins) to one pint of fresh milk daily or three packets of dried milk fortnightly. Dr. Wood thinks notification of ophthalmia neonatorum should be made direct to the county medical officer of health, but he is in the happy position of recording that of 59 notified cases of this disease, all recovered with vision unimpaired.

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[1] Copeman, S. M.: Brit. Med. Jour., 1920, ii., 159, Discussion on the Present Position of Vitamines in Clinical Medicine.

[2] Wyard, Stanley: THE LANCET, 1922, i., 840.

Cambridgeshire.

Dr. Frank Robinson's report shows that much attention is given to the question of the midwifery and nursing service both in the county and borough of Cambridge. Through the agency of the County Nursing Association the number of trained midwives has increased since 1916 from 24 to 50. There are now only four untrained midwives. All the trained midwives practising in rural areas are also district nurses. During 1922 three grants were made to the County Nursing Association for the training of nurse-midwives who have to undertake to practice for three years in the county after becoming qualified. Through the County Association three new district nursing associations covering ten parishes were started during the year. Grants are also made by the county council towards the expenses of some of these district associations in employing nurse-midwives. Since the passing of the Midwives Act, 1918, the proportion of cases in which the midwives summon medical aid has gone up from 5·2 per cent. in 1919 to 7·2 and 7·1 per cent. respectively in 1921 and 1922. Of the 152 cases in which a doctor was called in during 1922, the county council paid the fee in 102 cases but, wherever possible, the fee is recovered from the patient in whole or in part. The borough has its own maternity and child welfare scheme, and under this scheme 139 expectant or nursing mothers received dental treatment, of whom 58 were provided with artificial dentures, one condition being that they agree to their children receiving dental treatment both up to 5 years of age and during the whole of their school life. Some progress has been made in housing matters, but Dr. Robinson estimates that some 600 or 700 new houses are still required in the county, apart from new houses needed to replace worn-out property. The severe drought of 1921 stimulated the provision of schemes of water-supply, and progress in this direction is reported.

Cumberland.

Dr. F. H. Morison is inclined to attribute the great increase in infant mortality to unemployment and the resulting inadequacy, especially as regards vitamins, of the diet of a large section of the community. The districts which showed the highest rates were those where there was most distress—viz., Cleaton Moor, 166; Whitehaven, 160; Workington, 127; and Egremont, 121. Dr. Morison returns to the food question in speaking of the prevention of tuberculosis, and expresses his belief that education of the community in food values would constitute one of the most valuable public health campaigns. He thinks we should do as is done in the case of quack medicines and proprietary articles—i.e., we should repeat our teaching until everyone is convinced that what is repeated so often must be true. He thinks the two most hopeful methods of dealing with tuberculosis are segregation of advanced cases and raising the resistance of those who are most susceptible, such as contacts, debilitated, and so-called pre-tuberculous children. He suggests that the Industrial School at Cockermouth, at present disused, might be used with the latter object as a preventorium for debilitated children. Returning to the subject of the high infant mortality rate, Dr. Morison points out that "at the present time there are no maternity and child welfare centres in the county with the exception of the one at Wigton, which is worked by the Wigton District Nursing Association."

The medical superintendent of the Englethwaite Industrial Colony for Consumptives, Dr. Mark S. Fraser, reports that of 79 men who received treatment and training and left during the last three years 23 are earning their living. Of the 23, 16 are in receipt of a modified pension and it is impossible to say if they would be able to maintain their families without this subsidy. Eleven of the 23 are working at trades learned at the colony. Dr. Fraser has seen most of them and finds that their health and working capacity are not nearly so good as those of the seven ex-colonists who are employed at Englethwaite. In consequence letters have been addressed to the sanitary authorities concerned asking them to establish after-care committees to befriend ex-colonists belonging to their own areas.

East Suffolk.

Dr. G. I. T. Stewart points out that for railway and other reasons the problem of locomotion is a difficult one in East Suffolk, and that the formation of combined districts with whole-time medical officers is not easy. Hospital accommodation is "lamentably deficient," and for this coöperation is the remedy. Dr. Stewart suggests a scheme for four areas based on an adequate motor ambulance service: (1) southern area—hospital at Ipswich and Felixstowe; (2) north-western area—hospital at Stowmarket (West Suffolk to be asked to join); (3) north-eastern area—hospital at Lowestoft; (4) central area—to be provided for by a county hospital at Saxmundham. The V.D. work is done at Ipswich and Norwich, but a clinic is needed at Lowestoft. The inspection of midwives is carried out by the superintendent of the Suffolk County Nursing Association. Lowestoft has its own child welfare scheme. Otherwise there is little to record in the way of "centre" work. There are three one-day-per-week centres at Aldeburgh, Beccles, and Stowmarket with average attendance of 6, 15, and 17 respectively, and centres started at Felixstowe, Leiston, and Wickham Market have closed down owing to lack of interest.

West Suffolk.

Dr. A. H. Bygott reports that the proposal to form the sanitary areas of the county into two combined districts, each with its whole-time medical officer of health, has been rejected by a meeting of representatives. An alternative was the adoption of the Essex system, but only four of the district medical officers of health hold the diploma of public health. The Bury St. Edmunds administrative bodies have expressed dissatisfaction that more is not done for advanced cases of tuberculosis. Dr. Bygott points out that one cannot establish "homes for the dying," that the county sanatorium has raised its beds to the maximum, and that the fever hospitals in the county are not suitable for the purpose. The county council were prepared to take over the infirmary of the Bury St. Edmunds guardians. The Ministry of Health suggested the Mildenhall Workhouse, but its inaccessibility and the cost of adaptation and administration ruled it out. A more effectual remedy, says Dr. Bygott, is for the county and county borough councils to take over the treatment of the sick from the boards of guardians.

Fife.

Dr. G. Pratt Yule says measles, whooping-cough, and respiratory disease have played their part in the increased infantile mortality of 1922, and refers to overcrowding as the determining factor in the fatality of these diseases. In some areas housing schemes, aided by emigrations to the Colonies and U.S.A., have relieved the situation, but among the more busy mining communities there is much subletting which is tantamount to overcrowding. A large shelter has been fitted up with 16 cots for the treatment of surgical tuberculosis in children at the Glenlomond Sanatorium. Cases of pulmonary tuberculosis are being reported earlier, and male cases are accepting institutional treatment at an earlier and more hopeful stage.

Dr. Yule refers to the "handywoman" difficulty. Not infrequently, he says, unqualified women appear to be the sole attendants at confinements, but when investigation takes place there emerges "the shadowy supervision of a medical practitioner." Dr. Yule has written to the C.M.B. for Scotland for guidance as to what constitutes "direction" on the part of a medical practitioner, but so far no light has been forthcoming. He mentions that the Royal Sanitary Institute and the County Councils' Association have approached the C.M.B. for England on the same point, and that the English Board are of opinion that "under the direction of" means "in the presence and under the direction of" and further, that they (the English Board) intend to take the earliest opportunity of pressing for an amendment of the subsection of the Act dealing with the matter which will remove the words "habitually and for gain"—words which render the subsection futile at present.

Correspondence.

"Audi alteram partem."

CANCER AND DIET.

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[1] Copeman, S. M.: Brit. Med. Jour., 1920, ii., 159, Discussion on the Present Position of Vitamines in Clinical Medicine.
[2] Wyard, Stanley: THE LANCET, 1922, i., 840.

The point I submit is, that in any rational application of the calculus of probabilities there is always expressed or implied an alternative. Thus suppose four persons sit down to play bridge and the dealer receives the whole of a particular suit. The chance that this will happen is much less than one in *a* billion, a good deal smaller than one in 100 millions. Suppose the four players are intimate friends, they may be surprised, they may even write to the *Field*, but they will not suspect the dealer of cheating. But suppose that the four players are total strangers come together in the smoking room of a transatlantic liner, the opponents of the dealer who has dealt himself or partner 13 of a suit might do more than write to the *Field*. The point is that the alternatives in the two cases are not deemed to be equally probable. The probability that an intimate friend has cheated at cards is deemed to be very much less than 1 in a billion, but the probability that a total stranger has cheated is thought greater than that a particular event of this order of frequency *and favourable to him* has happened.

Consider the method of application of the calculus of probabilities to medical problems, usually regarded as legitimate. A persons have been attacked by a disease and treated with a particular remedy and *a* have recovered, B persons similarly attacked have not been treated and *b* have recovered. The fraction a/A is greater than the fraction b/B; is the difference significant? Let us suppose, which is *not* always true, that A and B are, apart from the giving or withholding the remedy, absolutely *in pari materia*, and that the probability that such a difference as $a/A - b/B$ might arise "by chance" can be arithmetically computed—which again is not always true—and that we find this chance to be 1 in a billion, what is the inference? The inference depends upon the nature of the alternative. If the remedy is such that its *possible* activity is not incongruent with the whole of our knowledge, we shall infer that it is more likely that the remedy had an effect than that an event which on the average happens once in a billion trials has happened this time. Suppose the disease were acute intestinal obstruction and the remedy painting the left wrist with iodine; we should refuse to believe that the cases were *in pari materia* or we should adopt the attitude of the friendly bridge players. Suppose the disease were diphtheria and the remedy antitoxin, we should unhestiatingly accept the alternative. Between those extreme terms lies a continuous series of instances; the mere statement of a probability is not and never can be sufficient of itself, it is only great or small in relation to something else. That is, of course, the argument of Hume—stated before his time by Locke, who said, "It is harder to believe that God should alter or put out of its ordinary course some phenomenon of the great world for once, and make things act contrary to their ordinary rule purposely, that the mind of man might do so always after, than that this is some fallacy or natural effect of which he knows not the cause, let it look ever so strange."

I need not use space to point out the application of these considerations to Prof. Richet's thesis, but those who are interested in the particular class of investigations to which he refers will find a very instructive discussion of the application to them of the calculus of probability in Prof. Edgeworth's notice [1] of Prof. John Coover's investigations.

I am, Sir, yours faithfully,

MAJOR GREENWOOD.

National Institute for Medical Research,
Hampstead, N.W. 3, Sept. 21st, 1923.

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[1] *Jour. Roy. Stat. Soc.*, lxxxii., 1919, 222.

A PLEA FOR THE NATIONALISATION OF OUR MENTAL HOSPITALS.

To the Editor of THE LANCET.

SIR,—It is not until quite recently that the attention of the medical profession, and to a certain extent of the general public, has been at all directed to the position of the treatment of disorders of the mind. Probably owing to their extreme complexity it has remained more or less in the background. No attempt has been made on anything but the smallest scale to apply the same methods of investigation and treatment which mark other branches of medical science. As a result the insane have been merely herded together in public institutions really more concerned with the safeguarding of the public than with alleviating the sufferer. Reform on these lines has merely meant a more humane segregation, with the result that scattered all over the country we find these large buildings, for the most part admirably and economically administered, where the insane are housed and fed while they may or may not recover. What position these institutions hold in the opinion of the outside public is clearly shown by the fact that practically all admissions to them are involuntary. Nowhere is there yet set up a system where the early sufferer will come for advice and treatment in the same way that he will flock to the ordinary out-patient department of any of our large hospitals.

But at last the mystery attached to the label "mental" is gradually being solved and removed. It is recognised that for the best results cases must be seen in their incidence. Also that disorder of the mind requires not only the specialist trained in psychological methods, but the help of the pathologist and the physician, in fact of every branch of the profession. And not only this, but equally important is skilled nursing of the very highest order. With what result? That the treatment and study of mental diseases is passing to the place where only these advantages can be reaped—into relation with our general hospitals and teaching centres. For if, say, a case of cardiac disorder or a fracture turns out badly, the patient can still carry on under a partial disablement; but let a disorder of the mind become chronic and it results in a complete failure and a permanent loss to the State. It is quite impossible and also unnecessary to alter our present asylums and make them into hospitals suitable for the reception and treatment of acute mental disorders; and equally impossible for the large bulk of their present medical staffs to keep themselves abreast of modern methods. And neither is this the most economical method. It is waste of time, money, and personnel to employ a highly trained staff on the nursing of idiots, dements, and the hopelessly insane. Having regard for the treatment they require, we can divide our patients roughly into two classes: in the early stages, when everything that our science can possibly do for our patient must be tried; if this fails in its end and no recovery takes place, we pass to the second, the chronic or hopelessly insane, requiring merely some institution where they can be looked after as economically as possible with due regard to their happiness, comfort, and welfare, and where they can be employed to the best advantage with regard to their cost of maintenance and by this means made the least possible burden to the State.

Now arises the problem, how can early mental disease be brought into contact with the conditions it requires for its treatment? *It is impossible to* think that under present conditions this will ever maintain in the majority of our county or borough asylums. Their isolated position *alone is almost* a bar to most of them. Neither ought the matter to remain in statu quo until the country can stand the enormous expense of building and equipping new and modern mental wards. In the meantime there is one obvious way in which the best *can be done for* the sufferer. It is out of the question that every case of mental disorder can be sent for treatment to one or other of our great teaching centres. But why not bring a recent product of this centre to him? A constant supply of skilled physicians, au fait with every advance in the diagnosis and treatment of mental diseases, must be supplied to all our county and borough asylums. Not to one or two of them, but to every one in which early acute cases are admitted. Present buildings cannot be altered, neither can their inaccessibility; but at least they can be supplied with a staff of the highest efficiency, who will do their best in the conditions under which they have to work to apply for the benefit of those under their care the methods of investigation and treatment emanating from our hospitals and universities. And this can only be brought about by nationalising the whole asylum service and bringing it under one central control.

Let us consider such a service a little in detail. It should most certainly come under the Ministry of Health, and the nucleus of its special control, or "G.H.Q. asylums," already exists in the present members of the Board of Control. At present this Board has no control, or practically none, except perhaps from a legal point of view. But under a national scheme it would own completely all asylums at present designated "pauper." It could introduce what reforms it wished, appoint the various resident staffs, and its visiting consultants could take with them into town and country a knowledge of the most recent methods of investigation and treatment, to place at the disposal of the resident staffs. For who has not served as house surgeon or later as divisional officer and does not appreciate how such visits keep a man up to the scratch? And how much better employed would skilled physicians be going over our recent admissions with us, teaching us and advising our actual treatment, than writing reports recommending a more general use of toothbrushes in such and such institution, or saying how nice the patients' dresses looked. In the same way there would exist at the Board of Control a department corresponding to that of the Quartermaster-General. These gentlemen would standardise everything in use, from dress material to medical stores, and would distribute them as in the army from a central depot or depots. Some commodities it would conceivably be cheaper to purchase locally. They would appoint the officers, and visit, inspect, and control the departments at present known as "stores," "farm," "clerk of works," "accounts," and even the padre. Corresponding members of asylum staffs would constitute a "service" just as would the medical side, and would reap the same benefits.

There would be an entrance examination, standardised pay, promotion, and pension. Examinations qualifying for promotion to a higher grade in the service would have to be passed before any step upwards, and most important, "movement orders" would be issued by the Board of Control. In this way all medical officers would periodically and regularly pass through one or other of our teaching centres as a part of their duty; there would be none of the present farcical method of appointment, and no one would be left out in the cold to rusticate and become a typical "chronic" to his own detriment and that of the patients under his care. Anyone failing to qualify for promotion would not be kept in the service but the right men would get to the top. It is the staffing of hospitals where actual treatment of recent cases is being undertaken which calls for the highest efficiency. To these would be supplied the young, active, progressive, and best qualified members of the service. Senior members would eventually be automatically moved either to fill purely administrative posts, or to the essentially chronic buildings where wise and economic administration is the main asset; and where their experience and foresight can be used to the best advantage of the service as a whole. The nursing service would be similarly constituted. Each institution would have a definite establishment, promotion to positions corresponding to N.C.O.'s would all have to go through G.H.Q. before being confirmed, recruiting locally for the junior posts, or "privates" if necessary.

The entire cost would be taken off the shoulders of local authorities and would become a common universal Government tax. The total expenditure of all our county and borough asylums for the year 1921 was under 8 million pounds, about the cost of one modern battleship, very little to pay when the importance of the question is realised. For the Government to take over its mental hospitals means no new expense, but merely a transference from a local rate to a national tax. A single control is absolutely necessary to prevent overlapping and to ensure economy and efficiency. Present institutions can then at once be used to the best advantage of the service, and not as at present, merely for local requirements. Some would be used solely for the chronically insane, on whom it is a waste of money and personnel to employ a highly skilled staff. Empty beds in these institutions can always be filled by segregating patients with no friends. Others could be specialised into convalescing hospitals, where patients on the way to recovery can be sent to reap the benefit of outdoor occupation; this in turn easing the demand for accommodation in the acute blocks. Of two more or less adjacent buildings, the one more easily adaptable and more accessible for a visiting staff could be used as the acute building for the reception of new cases, the other becoming essentially chronic in character and therefore needing no modernising and no highly skilled staff. It would seem that by wise administration the general lunacy tax should be appreciably less than the present average county or borough maintenance rate.

The patient, and a medical staff with the necessary training and skill, are brought into contact near to the former's home and friends. Beds for the early treatment of cases can be subsidised by the Government in some of our large general hospitals, out-patient departments set up and the best advice brought within the reach of all. Not only the patients' treatment, but their food, clothing, occupations, and amusements would be uniform and the best available. The present farcical investment of a lay committee with practically the sole right of discharge would depart into the waste paper basket. This power would be invested in the medical superintendent, at whose disposal in difficult cases would be the advice of the whole of the consulting staff of the service. A patient could receive his discharge as soon as fit and not have to wait for monthly meetings. And so it comes about that the very best of advice and treatment is placed at the disposal of the poorest; a state of affairs which maintains also in every other branch of our profession.

It would be up to each private mental hospital for the reception and treatment of acute mental disorders to put its house in order: the entire cost of which, of course, they themselves would have to shoulder. There could exist no possible bar to the present practice persisting of private patients being received into Government institutions. Provided, of course, that such buildings were deemed by the Board of Control as suitable for the class of case received, and that the charges, depending on the advantages and conditions offered, were privately borne. This paper is written in no attitude of criticism, nor does it pretend to have solved more than a very few of the difficulties, but rather in a spirit of hope that this important matter may soon be taken up. There is no money available in the country for expensive new buildings. Meanwhile, the problem is to make the best out of what we have actually got. How to tackle the task, so that as speedily as possible, an efficient service can be brought about with as little waste and as little disturbance as is absolutely necessary. At present, for obvious reasons, Smith who goes insane in "Blanktown" may receive every advantage and chance of recovery for 20*s.* a week; whereas Brown, because he happens to be domiciled in "Muddleshire," starts with a 30 per cent. disadvantage at perhaps half a crown a week cheaper. The brains of a country are its most important asset and should be the first charge on its estate. The present standard of the treatment of the insane as a whole is many years out of date. To bring that standard on to a level with that reached in any other of the ills that flesh is heir to, is a national affair, a matter of vital importance to future generations and to the race as a whole. It is surely up to the nation to take the matter in hand and to shoulder its responsibility, for private enterprise must inevitably fail. There must be some central controlling and guiding authority. Run something on these lines it would make a most attractive service. Not only will it attract good men into its own special branch, but it can utilise and bring the best brains in all branches of the profession as a whole, to bear on to the most difficult and abstruse of all medical problems. Difficulties there will be, but they can all be got over, and fortunate will be those privileged to assist in working out the scheme and to see it actually working. For come it will.

I am, Sir, yours faithfully,

A. T. W. FORRESTER, M.D. Lond.

Leicestershire and Rutland Mental Hospital,
Narborough, Sept. 18th, 1923.

INJURY AND DISEASES OF THE ARTICULATIONS.

To the Editor of THE LANCET.

SIR,—Mr. Timbrell Fisher is greatly to be congratulated on his research work in that very difficult field of physiology, the articulations, of which he gave a brief résumé in your issue of Sept. 15th. In discussing treatment, Mr. Fisher suggests that in many sufferers from arthritic disease of non-tubercular origin the infection has come to an end and that the whole of the symptoms are caused by the deformity, and he further implies that in this stage of the disease manipulative and presumably operative methods can be undertaken with a certain degree of safety, provided that too much force is not used in manipulating the affected joints. Mr. Fisher goes on to say that forcible manipulation is not advisable in the more acute forms, as it may give rise to a reaction after which the joint stiffens once more.

I would like to make it axiomatic in dealing with these conditions that until the disease is extinct—that is to say, until the infection is eradicated and there is no longer any risk of auto-inoculation—nothing forcible of any kind whatever must be done. I would add that manipulation may do a great deal of harm, because it may result in the spread of the disease into other parts of the body hitherto unaffected. The converse of this axiom is also true: once the infection is eradicated, any measures, manipulative or operative, can be undertaken with perfect safety. I base these conclusions on some 15 or 16 occasions when operative or manipulative measures were undertaken. Of these all have been successful except four. One of the four was a patient who, unfortunately, died from alcoholic delirium a few days after the operation. I have no reason to suppose that it would *not* have been successful. In the case of the other three, the operations were undertaken before the disease was eradicated, and the result was that some extension of the disease took place, and there was a long period of convalescence before anything further of this nature could be done. In one case three years, in another case six months, and in the third case not at all.

But it may be asked by what signs we may know that the infection is eradicated. This is a question of the greatest importance on which one would like to hear Mr. Fisher's views. All the patients in my care have undergone a course of vaccine treatment, and the antigens in every case have been streptococci, either stock or autogenous or both, and in the majority of cases *M. deformans*. My experience shows that as long as the patient is sensitive to small doses of these vaccines, it is neither safe to manipulate nor operate. But as soon as the patient can take large doses without any reaction, both are absolutely safe. Thus the three cases above-mentioned in which manipulation or operation failed were still sensitive to quite small doses—e.g., half to one million—whereas the whole of the successful cases took large doses, more than 20 million without reaction.

The criterion I would suggest then is the absence of response to a large dose of an appropriate vaccine. When, however, we consider the question of what that dose should be, some difficulty arises. It appears that vaccines prepared in different laboratories differ materially. I am quite ready to make a definite statement in regard to the correct "safety" dose of the vaccines I use, made in my own laboratory, and would put it at 20 million combined stock streptococci and *M. deformans*. But then my initial dose is one-tenth of a million, either of streptococci or *M. deformans*, and even this frequently cannot be tolerated previous to a course of desensitising peptone; whereas doses of streptococcal vaccine recommended by clinical laboratories and given by other men are usually far larger. Compare this initial dose with that of five million advocated by Dr. W. H. Wynne, for example, in your issue of Sept. 22nd. The reason of the discrepancy I do not know, unless it lies in the fact that 45 perfectly different varieties of streptococci comprise this stock vaccine and all were freshly isolated.

I am, Sir, yours faithfully,

Harrogate, Sept. 22nd, 1923. H. WARREN CROWE.

THE CAUSATION AND TREATMENT OF PRURITUS ANI.

To the Editor of THE LANCET.

SIR,—Pruritus ani is very common, and its causation appears to be wrapped in obscurity; its treatment, therefore, is naturally unsatisfactory. As Dr. E. F. Hoyt of New York has said, "the meagre literature upon this subject hobbles upon the crutches of hypothetical inferences which suggest a panoramic array of medical agencies, all unsatisfactory, and thereby confessing to a sad condition of helpless empiricism." Having been a sufferer from this complaint off and on for 34 years, it has occurred to me that my personal experience with regard to its treatment may be of value to those who have cases of this sort. I found that relief could always be obtained by getting out of bed as soon as one was roused by the itching, and after evacuation of the irritating mucus by straining, by free washing of the everted mucous membrane with cold water. This usually produced a quiet condition for the rest of the night. Then I found a collapsible tube of carbolic vaseline about ℳ ix. to 1 oz. of use; a little applied to the anus and into the bowel immediately before going to bed enabled me to get to sleep without the onset of the itching which otherwise seemed invariably to occur as soon as I tried to compose myself to sleep. For years I slept with a tube of this vaseline by my bed, and if I woke in the night I always applied a little of the ointment and so repressed the inclination to scratch.

About 24 years ago I consulted Sir Charles (then Mr.) Gordon-Watson. He held the view that the cause of this trouble lies in the papillæ of Morgagni, which, situated at the anorectal junction, are absent in the majority, yet present in a considerable proportion of individuals. They are normally small white glistening papillæ, pyramidal or triangular, with the apices directed upwards and inwards towards the lumen of the gut. They vary from one to six, and when hypertrophied resemble in size and shape the writing end of an ordinary lead pencil; when much hypertrophied they may be felt as small shotty nodules. In some cases one finds small fibrous branched papillæ as well; and I think it is advisable to destroy these also as they may possibly be an additional source of irritation. Dr. Campbell Margarey wrote a paper on this subject several years ago the *British Medical Journal*, from which I quote ely. He examined 50 out-patients with the culum and as far as possible in consecutive order. this series papillæ were present in 19 cases, or per cent. The average age was 39 and of those in ich papillæ were found was 38 years. The number papillæ varied from one to six, with an average of o. In a series of patients suffering from pruritus attending the out-patient department from June to vember, 1910, hypertrophied papillæ were present in , or 25 per cent. The papillæ were cauterised more less thoroughly in all these cases, and in only one s there a lack of improvement. The majority de two subsequent attendances, reporting great lief, and then ceased to attend. This would serve show that the cure of this exasperating complaint d been effected. In my own case Sir Charles rdon-Watson destroyed these hypertrophied papillæ th the electric cautery. This was done without even local analgesic and was not very painful. The hing, which had become unbearable, disappeared at ce like magic, and I remained absolutely free for out five years. There was then a slight return casionally, but carbolic vaseline kept it in check. bout a year ago, as the pruritus had again become ther troublesome, I was examined by a surgeon, ving first told him what he would probably find. e destroyed five or six papillæ with instantaneous sults, and has since treated four similar cases with ually good effects. The reappearance of a papilla in my case always attended by a return of the ruritus and discharge of irritating mucus which pidly causes the skin to inflame.

It is possible for the patient accurately to locate his own sensations the position of the papilla—g., at 6–9–10 o'clock—and in this way he can guide he operator as to where to look for it. If the skin e excessively sensitive and the sphincters very rritable, a little ½ per cent. novocain solution may e injected into the sphincters so as to cause their aralysis and allow of free exposure of the affected rea. In one of our cases spinal analgesia was esorted to on account of the extreme excoriation and ensibility of the parts. The patient should be arned that the papillæ are likely to recur, and advised o return for their destruction immediately any fresh tching is felt.

I am, Sir, yours faithfully,

F. J. W. PORTER,
Major, R.A.M.C. (retd.)

Bombay.

THE MILNE TREATMENT OF SCARLET FEVER.

To the Editor of THE LANCET.

SIR,—The article by Dr. G. Gushue-Taylor in your issue of Sept. 8th on the Treatment of Scarlet Fever by Eucalyptus Oil and Carbolic Oil versus Isolation is a convincing demonstration of the futility of the treatment which has become associated with the name of its originator. What can be said of a method which, in the hands of the late Dr. Milne himself, produced a "return" case-rate of 46 per cent.? What would be said of any isolation hospital which produced any such a percentage of "return" cases of scarlet fever? The figures show that in 1904–5 cases treated by Dr. Milne by isolation gave a return case-rate of 1·2 per cent.

In 1918 cases treated by Dr. Milne by the Milne method—return case-rate 46 per cent.

In 1921 cases treated by Dr. Gushue-Taylor by the Milne method—return case-rate 28·2 per cent.

In 1922 cases treated by Dr. Gushue-Taylor by isolation—return case-rate 3·7 per cent.

There are two criticisms of the so-called Milne treatment. 1. It is prima facie unscientific. One could not expect any satisfactory sterilisation of the pharynx to be effected by the methods proposed. Further, scarlet fever is not spread by the skin, therefore the treatment with eucalyptus oil is a redundancy. 2. It has now been proved by an investigation lasting over 18 years that in practice it does not work. It is desirable to call attention to the article as some medical officers in search of a cheaper and more satisfactory method of dealing with scarlet fever than hospital isolation have sought to find it in the Milne method. Many cases of scarlet fever can be nursed at home, but the Milne treatment is of no assistance in preventing the dissemination of the disease or in lessening its complications.

I am, Sir, yours faithfully,

A. H. G. BURTON,
Medical Officer of Health, Ilford.

Sept. 18th, 1923.

Obituary.

MARGARET BOILEAU, M.B., B.S. LOND.

THE death of Dr. Margaret Boileau on Sept. 17th at Norwich removes an interesting personality from the ranks of medical women. Born in 1867, Dr. Boileau qualified M.B., B.S. Lond. in 1906 from the London (R.F.H.) School of Medicine for Women, having taken up the study of medicine preparatory to devoting herself to social and religious work. After working as clinical assistant to out-patients at the Elizabeth Garrett Anderson Hospital she started a general practice in Hammersmith, but for family reasons she was obliged to give up her medical work and return to her home at Ketteringham, in Norfolk. Here she engaged in social and medical activities, giving lectures on physiology to missions, lectures on venereal diseases, first-aid and Red Cross lectures, and assisting at an infant welfare clinic at Norwich. During the war Dr. Boileau became commandant of the Swainsthorpe Auxiliary to the Norfolk and Norwich Hospital and her work was specially commended. She was also Commissioner of Girl Guides for South Norfolk, and was elected as lay representative on the House of Laity, being one of the first women to hold this position.

Dr. Boileau will be much missed in Norfolk. Having an unusual faculty for explaining scientific truths in a clear and simple manner, her talks on hygiene and kindred subjects were much appreciated. Dr. Boileau had a good memory for detail, having travelled widely and read much. She had for every occasion an apt quotation, an appropriate illustration, or an amusing anecdote. She had a great gift for friendship and her loss will be deeply felt by a large circle of friends, people of many different classes and kinds.

THE LATE MR. H. D. FARNELL, F.R.C.S., O.B.E., J.P.

WE published last week a brief obituary notice of Mr. Henry Dawson Farnell. Since then we have received the following appreciations. The first, from Dr. A. Craigmile, is as follows: "Henry Dawson Farnell and I first met in the summer of 1875 at the Northern Hospital, Liverpool (now the David Lewis Northern Hospital), to which he came as senior house surgeon, and I as house physician; and so began a friendship which lasted without a break till now. Farnell had come straight from University College Hospital, where he had been under the influence of Marcus Beck—one of the junior staff. This young surgeon, shaking off the traditions of the London School, was struck by the reports of Lister's new antiseptic surgery, and had gone to Scotland to study under Lister himself. He returned full of enthusiasm for the new method, and so Farnell, inspired by Beck, with the sanction of his staff, introduced it to the Northern, and we were soon in the full swing of all Lister's ritual, as it then existed. Presently a marked change took place in the wards: suppuration disappeared, compound fractures healed kindly, and septicæmia and pyæmia were known no more, and so Farnell had the great honour of first introducing antiseptic surgery and Lister's methods to Liverpool.

The late Mr. Chauncy Puzey—one of our honorary surgeons—in his presidential address to the Liverpool Medical Institution many years after, paid a generous tribute to the work Farnell had done in this direction. Of his work in Eastbourne it is the province of others to speak. From the beginning we were drawn to one another by mutual tastes in many things, especially in literature and politics. He was a great admirer of Sir Walter Scott, and on holidays, spent together, he used to quote favourite passages and pithy sayings from his favourite novels, citing one incident after another. All who knew him well were aware of the interest he took in motoring to new places, where an old church with famous monuments and brasses and piscinæ was sure to claim his rapt attention, for he took the keenest pleasure in the history of his country and its old traditions, and knew nearly every cathedral well. He was 'the dearest friend and most unwearied spirit in doing courtesies'—ever loyal and unselfish and true to his principles wherever they might lead him."

Another colleague writes: "Farnell was not only a great surgeon, but a man to be trusted implicitly. His patients loved him for his tender care and unselfish devotion. In the prime of his life Farnell was a very type of mental and bodily vigour, and his energy was almost incredible. Even in the last months, when a certain failure of health necessitated some slacking off of labour, he stuck to such work as was possible; on the very day of the seizure, which was to prove fatal in so short a time, he took his seat on the Bench—he had been a justice of the peace for nearly 20 years—and the first symptom of his illness occurred when he was parting from a patient. He thus died as he himself would have wished, 'in harness,' and has left a void in the profession which will indeed be hard to fill."

The Services.

CHANGES IN THE DIRECTORSHIP OF THE MEDICAL SERVICES.

In July last Sir William B. Leishman took over from Sir John Goodwin the appointment of Director-General, A.M.S., resigning the Directorship of Pathology, in which he is succeeded by Colonel D. Harvey, while Major A. G. Rolleston is appointed Deputy Assistant-Director. On Oct. 1st Rear-Admiral Joseph Chambers will succeed Surgeon Vice-Admiral Sir Robert Hill as Director-General of the Medical Department of the Royal Navy. In the Indian Medical Service, as we announced on August 4th, Colonel Charles Harford Bowie-Evans became Director-General of Medical Services in place of Lieut.-General Sir C. H. Burtchaell, this being the first time that an officer of the I.M.S. has been appointed to be Director-General of Medical Services. At the same time the retirement of the Director-General, I.M.S., Sir William Rice Edwards, was announced; he has been appointed representative of the Government of India on the Permanent Committee of the International Bureau of Public Health. This latter appointment was held by Major-General Sir Richard Havelock Charles, who has vacated office as president of the India Office Medical Board and medical adviser to the Secretary of State in Council, Major-General J. B. Smith taking his place.

ROYAL ARMY MEDICAL CORPS.

Capt. P. Carney retires, receiving a gratuity, and is granted the rank of Maj.

The undermentioned temp. Capts. relinquish their commns. and retain the rank of Capt.: A. St. J. Bateman, E. B. Jones, E. H. Milson, and M. Shipsey.

ARMY DENTAL CORPS.

Capt. R. W. Shortreed, late Spec. List, to be Capt.

RESERVE OF OFFICERS.

Lt.-Col. St. J. B. Killery having attained the age limit of liability to recall ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Capt. W. F. Denning (late 4th Bn., Duke of Wellington's Regt.) to be Major.

TERRITORIAL ARMY RESERVE.

The undermentioned officers having attained the age limit are retired and retain their rank: Lt.-Cols. A. L. Jones and W. McG. Young (with permission to wear the prescribed uniforms); Maj. W. T. Blackledge (with permission to wear the prescribed uniform); and Capt. W. J. C. B. Pitt.

The undermentioned relinquish their commns. and retain their rank: Capts. S. Sharples and W. Boyd; Lts. A. L. Bastable and J. C. Jefferson.

Capt. F. D. Marsh, from General List, to be Maj.

General Hospitals: Lt.-Col. G. S. A. Ranking, having attained the age limit, is retd. and retains the rank of Lt.-Col.

INDIAN MEDICAL SERVICE.

Capts. R. H. Candy, Jamasji Cursetji Bharucha, H. Hingston, F. J. Anderson, and E. V. Morrison to be Majs.

ROYAL AIR FORCE.

Flight Lt. J. Paxton relinquishes his temporary commission on ceasing to be employed.

DEATHS IN THE SERVICES.

Surgeon-Captain Edward O'Malley, R.N., who died at Haslar Hospital on Sept. 20th, aged 51, was the son of the late Deputy Inspector-General O'Malley, R.N., and received his first commission in 1897. He saw service in the *Dido* during the Boxer rising, and was with the *Porpoise* in the Somaliland campaign. He served afloat with various ships of the Fleet during the Great War, and was only invalided out of the Navy 12 months ago. He leaves a widow but no children.

Medical News.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Post-graduate courses in various specialties will be given during October in London. Beginning on Monday, Oct. 1st, there will be a course on urology at St. Peter's Hospital for Stone. Demonstrations will be given in the out-patient department every afternoon, and in addition lecture-demonstrations by members of the staff, at 2 P.M., four times a week. A course of eight lectures on the more important diseases of tropical countries will be given by Dr. Low and Dr. P. Manson-Bahr at the London School of Tropical Medicine, beginning on Tuesday, Oct. 2nd. A course in laryngology, rhinology, and otology will be given at the Central London Throat, Nose, and Ear Hospital from Oct. 8th to 26th; clinical lectures and demonstrations will be given by members of the staff each day from 9.30 to 5 P.M. A course on children's diseases will be given at the Victoria Hospital for Children from Oct. 8th to Nov. 3rd, and special clinical instruction in ophthalmology will be available at the Royal London Ophthalmic Hospital during the whole of the month. From Oct. 15th to 27th short intensive courses in cardiology and proctology will be given at the National Hospital for Diseases of the Heart and St. Mark's Hospital respectively. A short course in dermatology will also be held at the Hospital for Diseases of the Skin, Blackfriars, from Oct. 29th to Nov. 10th, and a fortnight's "refresher" course in general medicine and surgery from Nov. 5th to 17th. Copies of the syllabus and full particulars regarding the above courses can be obtained from the secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W., and as in some cases the numbers are limited, early application should be made.

GUY'S HOSPITAL BIENNIAL DINNER.—This dinner will be held at the Connaught Rooms, Great Queen-street, London, W.C., on Wednesday, Oct. 17th, at 7 P.M., Mr. G. Bellingham Smith presiding. The hon. secretary is Mr. Arthur W. Ormond, from whom further information may be obtained.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.—The winter session will commence on Thursday, Oct. 4th, at 4 P.M., when Mr. William Stuart-Low will deliver an address on the Rôle of the Mucous Membrane in Diseases of the Nose, Throat, and Ear.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN-SQUARE, BLOOMSBURY, W.C.—The syllabus of the post-graduate course to be held from Oct. 8th to Nov. 30th has now been issued. The course will consist of lectures and demonstrations on the Pathology of the Nervous System on Mondays at 12 noon; out-patient clinics on Mondays, Tuesdays, Thursdays, Fridays, 2 P.M. to 3.30 P.M.; clinical lectures and demonstrations on the same days at 3.30 P.M. Dr. J. Godwin Greenfield will give a course of lectures and demonstrations on Neuro-Pathology on Mondays at 12 noon.

[edical Defence Union.—The annual general ting of the Medical Defence Union will be held at the al Hotel, College Green, Bristol, to-day, Saturday. t. 29th, at 5 P.M., Sir Charles Ballance presiding.

)r. Adam Patrick, of Glasgow, has been appointed essor of Medicine at St. Andrews University in succession rof. A. M. Stalker.

t. Thomas's Hospital.—The old students' dinner take place at the Princes' Restaurant, Piccadilly, on . 26th, at 7 o'clock for 7.30. The chair will be taken by W. H. Battle.

ledico-Legal Society.—A meeting will be held 11, Chandos-street, Cavendish-square, London, W., on . 16th, when a paper will be read by Mr. W. Greaves-Lord, ., entitled Miner's Nystagmus, which will be followed by iscussion.

Medical Sickness, Annuity, and Life Assurance ciety.—The annual general meeting of the company will held at Lincoln House, 300, High Holborn, W.C. 1, on t. 1st, at 4 P.M. Among other business a proposal will be isidered that the sum of £1 1s. should be paid to the irman and each director for every attendance at the etings of the board or of committees of the board and neral meetings.

Pharmaceutical Society of Great Britain.—ie opening of the eighty-second session of the school of armacy, 17, Bloomsbury-square, London, W.C., will take ace on Oct. 3rd, when Dr. W. E. Dixon, F.R.S., will give e inaugural address at 3 P.M.

National Institute for the Blind.—The cond "Sunshine House" for blind babies has been opened Birkdale, Southport. Nearly five years ago the first me of the sort was established at Chorley Wood, Herts. nce then the home has always been full, while there has ways been a long waiting-list of infants. The establishent and maintenance of these homes go far to relieve resent misery and distress and to minimise the possibility future hardships by creating the ability to overcome them.

Charing Cross Hospital Medical School.—The nnual distribution of prizes will be held in the out-patients' all of the hospital (entrance in King William-street) on ct. 3rd, at 3.30 P.M. Dr. William Hunter will distribute he prizes and deliver an address entitled Some Problems of lodern Medical Education.

The *Annual Dinner of Past and Present Students* will take lace on the evening of the same day in the Adelaide Gallery, atti's Restaurant, Strand, W.C., at 7 for 7.30 P.M., Dr. . Watts Eden presiding. The guests present will include ord Fairfax, Sir Donald Maclean, Sir Humphry Rolleston, nd Prof. W. W. Chipman, of Montreal.

Psychological and Physical Development of the Child.—A series of six lectures for mothers on this subject will be held at Carnegie House, 117, Piccadilly. The lectures will be under the headings of the Baby (from birth to 5 years), the Child, and the Adolescent. The psychological aspect of infant life, childhood, and adolescence will be dealt with by Dr. H. C. Cameron on Nov. 6th, Dr. Niall on Nov. 13th, and Dr. Elizabeth Sloan Chesser on Nov. 20th; while the physical aspect will be discussed by Dr. Charles Anderson on Nov. 27th, Dr. Flora Shepherd on Dec. 4th, and Sir Bruce Bruce Porter on Dec. 11th. An introductory lecture by Dr. Crichton-Miller entitled the Well-meaning Mother on Oct. 30th, and a concluding one on Dec. 16th by Miss Smeeton, the Nurse and the Nursery, will complete the series. The lectures take place on Tuesdays at 3.15 P.M. Tickets (10s. 6*d*. for each lecture or £2 5s. for the series) may be obtained from Viscountess Erleigh, 65, Rutland-gate, London.

Donations and Bequests.—Mr. James Philip Bauer, of Manchester and Blackpool, left £1000 to the Manchester Royal Infirmary to endow a bed to be called the "James Bauer" bed; £100 each to St. Mary's and Southern Hospital, Ancoats Hospital, and many other bequests to Jewish charities in Manchester.—During the past month subscriptions and donations have been received by the Manchester Children's Hospital, totalling £1718, including donations from the Hospital Saturday Fund of £1388 and Salford Musical Festival of £95.—Local charities in Manchester have profited to the extent of £1613 from the result of the St. Leger Sweepstake in Rusholme: Manchester Royal Infirmary, £500; St. Mary's Hospitals, £400; Ancoats Hospital, £163; Rusholme Nurses Fund, £100; and some other institutions in proportion.

Cromer Cottage Hospital.—This well-equipped institution was presented to Cromer by the late Mr. G. W. Collison, and was opened on June 23rd, 1888. The hospital is a two-storied building, containing on each landing two large wards with eight beds in each, and two smaller wards for serious or operation cases, with two beds in each, the men's wards being on the ground floor, with an outside shelter for tuberculous cases, and the women's wards above, with a verandah opening out from the larger ward. The operating theatre is on the upper floor—a spacious apartment, about 21 feet by 20, with two large windows. For night operations an electric lamp is used and a new lamp is about to be installed at a cost of £50. The walls of the theatre are lined with glazed tiles, rounded off at all corners. A lift is installed. The hospital is provided with an X ray room, fitted up in June, 1913, by subscriptions from patients and well-wishers of Dr. H. C. Dent, on his retirement after 25 years' service. The resident staff consists of a matron, ward sister, and four probationer nurses. The medical staff is composed of the local medical men, Drs. R. Colvin-Smith, A. Burton and R. Grant, with two dental surgeons and a radiographer. Dr. F. W. Burton-Fanning, Norwich, is honorary consulting physician; Sir Hamilton Ballance and Mr. J. Burfield, of Norwich, honorary consulting surgeons, and Dr. A. J. Cleveland, Norwich, honorary consulting radiographer. The institution is supported by voluntary contributions, and fees are charged to patients as follows: Uninsured men and women, 10s. a week; insured men, 15s., and insured women 12s. 6*d*. a week. Private patients are occasionally admitted at 3 guineas a week. The financial report for the year ending September, 1922, shows a balance of £153 4s. 10*d*. The medical report states that 262 patients were admitted during the year, 116 males and 146 females. Of these 245 were surgical cases, including 36 accidents, and 17 medical cases. Two hundred and six patients were discharged cured, 26 improved, and there were 17 deaths, and 11 patients remaining in the hospital. There were 95 X ray patients, hospital and private. There were 179 operations, including dental cases, and six operations under local anæsthesia. The daily average number of patients was 11, the average expenditure per patient £6 4s. 10*d*., and the average expenditure per bed (20 beds) £81 15s. 5*d*.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Oct. 2nd.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)
Presidential Address:
Mr. R. C. Elmslie: Manipulative Surgery.
Cases: The following cases will be shown by:—
Mr. Elmslie: Deformity of Spine of Tibia.
Mr. Laming Evans: The Result of Combined Steindler and Whitman Operations for Talipes Calcaneo-cavus.
Mr. W. H. Ogilvie: Three cases of Primary Myositis.
Mr. P. Bernard Roth: Fracture Dislocation of Radius.
Mr. Maynard Heath: Recurrent Dislocation of Inner End of Clavicle.
Mr. Whitchurch Howell: (1) Tendon Transplant for Wrist-drop; (2) Tendon Fixation for Foot-drop.

Thursday, Oct. 4th.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.
Specimens:
Mr. Alfred B. Danby: A Uterus removed for Concealed Accidental Hæmorrhage. (Cæsarean hysterectomy.)
Mr. Everard Williams: Adenomyoma in a Malformed Uterus.
Short Communications:
Dr. H. Williamson and Dr. G. F. Abercrombie: A case of Inversion of the Uterus caused by a Squamous-celled Carcinoma of the Fundus.
Mr. W. Gilliatt: Placenta Prævia in Three Successive Pregnancies.
Paper:
Mr. Gordon Luker: Treatment of Puerperal Septicæmia. (A new method.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Oct. 1st.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2.30 P.M., Dr. Saunders: Medical Wards.
TUESDAY.—11 A.M., Dr. Paterson: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Dept.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 12 noon, Dr. Endean: Venereal Diseases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturday, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

ST. MARY'S HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

MONDAY, Oct. 1st.—11 A.M., Mr. Aleck Bourne: Anticipation of Mechanical Difficulties in Labour, illustrated by lantern slides. 12 noon, Dr. Wilfred Harris: Encephalitis Lethargica. 2 P.M., Dr. Graham Little: Diagnosis of Some Common Diseases of the Skin, illustrated by cases. 3 P.M., Prof. F. Langmead: Some Functional Disorders in Young Children.

LIVERPOOL UNIVERSITY CLINICAL SCHOOL.

(At 3.30 P.M. each day.)

MONDAY, Oct. 1st.—(At the Children's Hospital.) Dr. Fordyce: Glycosuria: (1) Cases of Diabetes Mellitus under Treatment with Insulin; (2) Cases of Non-diabetic Glycosuria, Diagnosis, Tests, Treatment.

TUESDAY.—(At the Southern Hospital.) Mr. Douglas-Crawford: Common Surgical Lesions of the Jaw.

WEDNESDAY.—(At the Northern Hospital.) Dr. Bligh: Types of Mental Defects in Children.

THURSDAY.—(At the Stanley Hospital.) Dr. Gullan: Diseases of the Endocrine Organs—notably Thyroid Gland, Pancreas, and Suprarenal Gland.

FRIDAY.—(At the Royal Infirmary.) Dr. Abram: Clinical Medicine.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.

TUESDAY, Oct. 2nd.—4.15 P.M., Dr. F. E. Tylecote: Some Recent Abdominal Cases.

FRIDAY.—4.15 P.M., Dr. Judson S. Bury: The Regional Diagnosis of Paralysis.

Appointments.

ASH, W. M., M.B., B.S. Lond., D.P.H., has been appointed Deputy Medical Officer of Health for the County of Middlesex.

BERRY, R. B., M.D., Ch.B. Vict., D.P.H., Medical Officer of Health for Gloucester.

ROWAN, J., M.B., C.M. Glasg., an additional Ophthalmic Specialist Medical Referee under the Workmen's Compensation Act for the Sheriffdom of Lanark.

STANSFIELD, TOM, M.B., B.S. Lond., Hon. Assistant Physician to the Royal Berkshire Hospital, Reading.

TURNER, MARY I., M.B., Ch.B. Vict., D.P.H., Assistant M.O.H., Chester.

Certifying Surgeons under the Factory and Workshop Acts: LEES, J. A., M.B., Ch.B. Vict. (Rawtenstall); BARTLETT, J. H., L.R.C.P. Edin., L.R.F.P.S. Glasg. (Harrold District of Bedford); CARSON, C. O., L.R.C.P. Lond., M.R.C.S. (Lydney).

Vacancies.

For further information refer to the advertisement columns.

Bristol Royal Infirmary.—Hon. Dental Surgeon.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Three Registrars.

Croydon Borough Sanatorium, North Cheam.—Res. Med. Supt.

Croydon General Hospital.—Jun. H.S. £150.

Derbyshire Royal Infirmary, Derby.—Two H.S.'s., H.P., &c. Each £200.

Duff House Private Hospital, Ruthin Castle, North Wales.—Res. Asst. P. £300.

Egyptian Government School of Medicine.—Lecturer in Experimental Physiology. L.E.540 a year.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. Also Res. M.O. £500.

Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and Asst. Cas. O. £50. H.S. £50.

Hull City Asylum.—Jun. Asst. M.O. £300.

Italian Hospital, Queen-square, W.C.—Asst. Anæsth.

King's College Hospital.—Clin. Assts. Med. and Surg. Out-patient Officers. Sambrooke Med., Surg., and Obstet. Reg.

Kingston-upon-Hull City and County.—R.M.O. £400.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

London Lock Hospital, 91, Dean-street, W.—H.S. £200.

Middlesex Hospital, W.—Radium Officer. £300.

Mount Vernon Hospital for Diseases of the Chest, Northwood, Middlesex.—Asst. Phys.

Newcastle-upon-Tyne City Hospital for Infectious Diseases.—Res. Med. Asst. £350.

Norwich, Norfolk and Norwich Hospital.—Hon. S.

Oswestry, Shropshire Orthopædic Hospital.—Res. Surg. O. £500. Two H.S.'s. £250.

Paddington Green Children's Hospital, W.—H.P. and H.S. Each £150.

Prince of Wales's General Hospital, Tottenham, N.—H.S. £150. H.P. £150. Also Jun. H.S. and Jun. H.P. £110 each.

Royal Eye Hospital, St. George's Circus, Southwark, S.E.—Hon. Asst. S. Also Jun. H.S. £75.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £100.

St. Pancras Metropolitan Borough.—M.O.H. £1100.

South London Hospital for Women, Clapham Common, S.W.—Temp. Asst. P.

South Mimms, Barnet. Clare Hall Hospital and Sanatorium.—Asst. M.O. £350.

Staffordshire General Infirmary, Stafford.—H.P. £150.

West Bromwich and District Hospital.—Res. Asst. H.S. £180.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. H.S.'s. £150 and £100 respectively.

York, North Riding Mental Hospital.—Temp. Asst. M.O. 7 guineas weekly.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Wirksworth, Derbyshire.

Births, Marriages, and Deaths.

BIRTHS.

BREWERTON.—On Sept. 23rd, at Harley-street, W., the wife of Elmore Brewerton, F.R.C.S., of a daughter.

GILMOUR.—On Sept. 17th, at Dora-road, Wimbledon Park, S.W., the wife of Dr. A. Gilmour, of a son.

MACRAE.—On Sept. 20th, at Edwardes-square, Kensington, the wife of Captain A. Campbell Macrae, I.M.S., of a daughter.

NEIGHBOUR.—On Sept. 19th, the wife of Dr. Philip Neighbour, of Feltwell, Norfolk, of a daughter.

MARRIAGES.

BANFIELD—OSBORN.—On Sept. 20th, at St. Mary's the Virgin, Dover, by the Revd. Canon Elnor, Capt. E. L. Banfield, *M.C.*, Royal Irish Fusiliers Reserve of Officers, eldest son of Mr. R. Banfield, O.B.E., Deputy Chief Constable of Cornwall, and Mrs. Banfield, of Bodmin, to Hylda Gwynedd (Nancy), second daughter of Dr. F. A. and Mrs. Osborn, of Clyde House, Dover.

FIRMAN-EDWARDS—ANDERSON.—On Sept. 15th, at St. John's Church, Coulsdon, Surrey, Langdon Firman-Edwards, M.B. Cantab., to Hylda, younger daughter of Mr. and Mrs. C. Labat Anderson, The Durdans, Purley, Surrey.

DEATHS.

BOILEAU.—On Sept. 17th, Margaret Lucy Augusta Boileau, M.B., B.S., daughter of the late Sir Francis Boileau, Bart., of Ketteringham Park, Norfolk, aged 56 years.

MAGUIRE.—On Sept. 20th, at Stony Stratford, Bucks, Thomas S. Maguire, M.D., J.P., aged 78.

O'MALLEY.—On Sept. 20th, suddenly, at Haslar Hospital, Surgeon-Captain Edward O'Malley, R.N. (retired), of St. Ronans-road, Southsea.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

THE POSITION OF THE FRIENDLY SOCIETIES.

THE following is an abstract from the presidential address delivered by Mr. T. W. Huntley (Newcastle-upon-Tyne) at the National Conference of Friendly Societies held at Aberystwyth on Sept. 20th–22nd.

The question of the moment, said Mr. Huntley, was the new contract to be made with the doctors. The pre-war fee was 7*s.* 3*d.* per insured person per annum. After a demand from the doctors an arbitration award given early in 1920 raised the fee to 11*s.*, the difference being provided by an Exchequer grant and not by Health Insurance funds. A reduction of the fee to 9*s.* 6*d.*, effected in 1922, was to continue till Dec. 31st. After the issue of the Geddes Report on national expenditure, the Cabinet accepted a recommendation for the abolition of the Exchequer grant for medical service, and decided to introduce a bill to raise the contributions of the insured persons and employers. The proposal was strenuously opposed by the Consultative Council, on the ground that the time was inopportune for raising contributions, and the Council made a suggestion, which was accepted, that the amount required to maintain the contract with the doctors from April 1st, 1922, to Dec. 31st, 1923, should be borne by the accumulated funds of the approved societies.

Three points emerged from this position: (1) The possibility of a return to the pre-war per capitation fee of 7*s.* 3*d.* was clearly contemplated; (2) more than 7*s.* 3*d.* could not under any circumstances be paid from insurance funds without the full knowledge and approval of approved societies; (3) no repudiation by the Ministry of this condition had been made, but on the contrary Sir Alfred Mond, the then Minister, agreed to consult the approved societies.

Position of the Doctors.

The doctors' contentions, Mr. Huntley went on to say, were as follows: 1. The reduction of the capitation fee from 11*s.* to 9*s.* 6*d.* was agreed to on patriotic grounds and in ignorance of the fact that the insurance funds would bear the charge. 2. There were no grounds for a reduction of the present fee of 9*s.* 6*d.*, but there were reasons for an increase to 10*s.* 4*d.* and more. 3. The insurance funds were accumulating by millions a year and could carry a higher medical fee, and the fee should be a first charge upon the funds.

Criticism of Doctors' View.

In criticism of these contentions Mr. Huntley said that seeing that the additional payment was to be met by Exchequer grant they were not a party to the award of 11*s.*, but its grant caused them some surprise, and the Minister of the day said it was too high. To say that there was no ground for a reduction now was to ignore the fall in the cost of living since early in 1920, but many thousands of other people had not been allowed to ignore it. Nor could the following facts be overlooked: (1) That the original fee of 7*s.* 3*d.* was greatly in excess of what was received for club practice in pre-insurance days; (2) that no attempt had been made by reference to number of attendances per insured person or other statistics to prove that the fee is not a fair remuneration for the services rendered; (3) that the 7*s.* 3*d.* capitation fee gave an augmentation to the income of a large number of the profession such as no other circumstance has ever done and raised permanently their standard of living—that, in short, the doctors had done exceedingly well out of health insurance.

The claim that because the insurance funds were growing the present per capita fee, or a higher one, could be paid, and that this should be first charge on the funds, could not be admitted by any student of insurance. It meant the Act for the doctors, not the doctors for the Act. Of course the funds were growing, but with reference to the surpluses declared at the last valuation they could not overlook the actuary's warning that these had arisen through circumstances which could not be expected to be repeated—the abnormal death-rate of members of military age and the consequent premature release of reserves and high rates of interest.

Negotiation or Resistance.

It was their great desire to live and work in amity with the members of the medical profession. Theirs was a noble calling, and it was right to say that in the main panel doctors had given good service under their contracts. The Friendly Societies were not out for an underpaid medical service, but they did not think the original payment was less than the value of the service rendered. If the doctors could secure more from other sources they would assume the same attitude of non-intervention as before. The situation was not one for dictation by doctors and the societies must not falter in defending their members. They were prepared to negotiate, but if it was proposed to distribute beyond the present statutory limits any part of the funds for which they were trustees, without their full knowledge and agreement, then they would offer the most determined resistance.

A Resolution.

The Conference later passed a resolution to the effect that the sum paid from the funds of approved societies to insurance panel practitioners at the period when the agreement was terminated by the Government, on the recommendation of the Geddes Committee, was ample for the services rendered, and that no increase beyond 7*s.* 3*d.* per insured person payable out of approved societies' funds could be agreed upon without the consent of the societies.

A MATERNITY NURSING HOME ON HOSPITAL LINES.

MEDICAL men are often asked to name suitable homes to expectant mothers of the middle classes who wish to be confined away from their homes. The privilege of residing in the same house as her accoucheur has hitherto been largely confined to the class of women who use the big maternity and lying-in hospitals. Our attention has been drawn to Stone Field, Kidbrook-grove, Blackheath, London, S.E. 3, which is a large private house adapted as a maternity nursing home with two resident obstetricians and a staff of nurses holding the C.M.B. certificate. The home has 20 beds arranged in private rooms (7 to 11 guineas a week) and cubicles (6 guineas a week), these charges including motor service, patients being fetched free of charge from London and neighbouring districts, the service working day or night as required. Medical accouchement outfit is also provided free. With regard to medical fees, patients make arrangements with one of the residents or with their own doctor, who may conduct the confinement if it is desired. The house has spacious rooms and an attractive garden. Further particulars can be obtained from the matron of the home.

PUBLIC HEALTH IN BIHAR AND ORISSA.

(Concluded from p. 636.)

The Effect of Improved Agricultural Conditions on Crime.

IN the jails [1] of this province there was a considerable decrease in the numbers confined, from a total of 51,272 in 1920 to 42,290 in 1921, the average daily population being 5990, against 7845 in the previous year. The decrease is attributed by Colonel Sir H. E. Banatvala, C.S.I., I.M.S. (retired), Officiating Inspector General, to improved agricultural conditions, as shown by the large decrease (2423) in the offences against property; and in convictions for dacoity, which had been 361 in 1919 and 179 in 1920, but were only 111 in the year under report. The majority of the convicts were Hindus, but in proportion to the numbers of the free population in the province Mohammedans contributed 0·408 per 1000, Hindus 0·298, and Christians 0·227 per 1000. Of the total, 91·17 were illiterate. There was a considerable decrease in the number of youthful or juvenile offenders (under 20 years of age), from 855 in 1920 to 644 in 1921. Sir H. Banatvala remarks, very truly, that "it is unfortunate that we were obliged to keep in our juvenile jail boys under 16, lads of 16, and adolescents up to 21 years of age—all mixed together." He points out that 58 juveniles (under 16) were sentenced to from 2 to 15 days imprisonment, mostly for offences against property. "What useful purpose can be served by sending boys to a jail for such short periods I cannot imagine, and I think magistrates would exercise a sound discretion by availing themselves of Section 562, Criminal Procedure Code, or by releasing them after whipping—i.e., where allowed by law." It is to be hoped that this opinion will receive the attention it deserves. There is no doubt that juvenile offenders may receive very great and lasting benefit when undergoing terms of imprisonment long enough for the good influences brought to bear upon them to produce their effect; but time is required.

With regard to the health of the prisoners, the ratios of admission to hospital and average daily sick were 1163·0 and 48·9 per 1000, as compared with 885·6 and 42·1 in 1920. The death-rate also increased from 27·0 to 31·0, but this was below the mortality for the province (32·8). Gaya jail had the highest death-rate (74·1), a considerable increase over that of the previous year (55·9), due to cholera (11 deaths) and tubercle (13). At Cuttack the mortality was 50·2, compared with 14·6 in 1920, due chiefly to dysentery. There was an increase in cholera (32 cases and 14 deaths, against 13 and 5 in 1920); 23 cases occurred at Gaya (11 fatal). On the other hand, dysentery, so generally a scourge in jails, though causing 850 admissions to hospital, was fatal in only 24 cases (against 858 and 52 in 1920).

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[1] Patna Government Press, 1922.

In many instances the predisposing cause is hookworm infection, with which parasite "the average percentage of infection in this province is about 70." Malaria caused 1302 admissions to hospital, but only 3 deaths (255·4 and 0·5 per 1000). For pulmonary tuberculosis there were 87 admissions and 35 deaths. Of the whole number of 14,284 convicts discharged during the year from the Central and Districts jails, 60 per cent. gained and only 16 per cent. lost weight, a most satisfactory result from the public health point of view.

Report on Vaccination.

The Report on Vaccination [2] for 1921–22, by Lieut.-Colonel W. C. Ross, states that the total number of operations performed fell from 1,060,485 in the previous year to 939,851 during the period now reviewed (April, 1921, to March, 1922). The decrease is attributed to political unrest and active interference with the work of the staff: "the vaccinators are now unwilling to work in many places, and their numbers are likely to decrease, as they cannot realise their fees fully." Of the total operations (925,134) performed by the staff, 98·26 per cent. were successful. The small-pox mortality in the province during the last five years has amounted to 55,691, while in the preceding quinquennium it had been 40,437. Colonel Ross considers that the disease cannot be "effectively dealt with and stamped out unless vaccination is made compulsory throughout the province"; he would recommend that the age should be extended to one year, that vaccination should be free, and that the supervision should be delegated to district boards and municipalities.

Hospitals and Dispensaries.

During the year 1921 25 hospitals and dispensaries[2] were opened in Bihar and Orissa, and five were closed, the total number of these institutions at the end of the year being 454; moreover eight new dispensaries have been added during 1922. This progress is encouraging and satisfactory. The report states that "it is hoped to carry through the ideal scheme of having a dispensary for each *thāna* [police station] or for an area of each five square miles, in which area the medical officer of the dispensary will be responsible for the sickness of his area." As the area of the province is 83,181 square miles, this would mean 16,636 hospitals or dispensaries; probably "for each five miles square" is intended, which would mean 3327 institutions. "The great point is to have a medical officer who can reach at once the spot where epidemic disease breaks out, and so deal with it in the earlier stages, when it is possible to take effective action." This is undoubtedly a true economy in every way; *obsta principiis*. It is unfortunate that there is difficulty in getting doctors of the sub-assistant surgeon class, who at present prefer to avoid Government service; the cadre is always under strength. Altogether 4,003,991 patients were treated in 1921 at the various hospitals and dispensaries in the province, of which total 67,850 were in-patients; in 1920 the corresponding numbers had been 3,851,953 and 67,095. In the "State-Public, Local Fund, and Private-Aided Hospitals and Dispensaries" the total number treated was 2,962,623; the daily average of in-patients being 1781 and of out-patients 17,873. There was an increase in cholera mortality in the general population from 0·7 (in 1920) to 2·6 per 1000; the dispensary attendance rose from 4487 (with 605 deaths) to 12,230 (and 622 deaths) in 1921. "Until the rudiments of sanitation are thoroughly appreciated by the people, so long will the water-supplies of small towns and villages become infected on the return of villagers from cholera-infected parts. . . . All these matters require special consideration in the establishment of a public health organisation, which is urgently needed for the prevention of epidemic disease." As to plague, of which 1657 cases were treated, against 2161 in the previous year, "there is little that can be done with conditions as they are in Indian towns and villages." The people understand and appreciate the evacuation of houses, but what is required are rat-proof houses and grain-stores, and anti-plague vaccination. Small-pox admissions fell from 1532 in 1920 to 488 in 1921, but malaria increased from 755,423 to 824,252; owing to the increased cost of quinine it is impossible to obtain enough to allow it to be used in effective doses. There was some increase in pulmonary tubercle (6051 admissions and 143 deaths, compared with 5699 and 127 in 1920); intravenous injection of sodium morrhuate has given good results. There was also an increase in kala-azar (12,423 cases, against 8520 in 1920, and 5281 in 1919); treatment by intravenous injections of tartar emetic is much appreciated, and has no doubt led to an increase of admissions. In the eight leper asylums there were 1967 resident patients, compared with 1852 in 1920; this does not necessarily mean that leprosy is on the increase, but indicates that the lepers recognise the benefits of treatment. It is proposed to form a leper colony in the Santal Parganas (Bhagalpur Division), with the aid of the Santal Mission, to which a debt of gratitude will be due for this excellent scheme. A new radium institute has been built at Ranchi, and work in this direction has already been started by Lieut.-Colonel J. C. S. Vaughan, I.M.S. (retired), who is an expert in this treatment.

Progress is reported in many other directions, including improvement in maternity methods; the establishment of a medical college, and the introduction of post-graduate courses for assistant surgeons. Colonel Austen Smith, C.I.E., Inspector-General of Civil Hospitals, concludes his report by referring to the scheme for post-graduate courses for assistant and sub-assistant surgeons now in operation at the Calcutta Medical College, which will ensure their being kept up-to-date with medical science; and hopes that the pay and prospects of sub-assistant surgeons in the province will be improved, "as they are a very deserving body of Government servants, and I wish to see them a contented service."

THE TREATMENT OF WHOOPING-COUGH WITH ARTIFICIAL SUNLIGHT.

Dr. Ferdinand Schotten,[1] of Cassel, has succeeded in relieving the distressing condition of the paroxysmal cough followed by vomiting which makes the nursing of whooping-cough such a trial to parents. He reports 10 cases, all between the ages of 1 and 5 years, and all in the stage between the eighth and fourteenth days after the first attack of coughing, that is between the catarrhal and convulsive stages, the most distressing period for the mothers. The children all had marked mucous expectoration and frequent paroxysms. The children were submitted to artificial sunlight with the chest exposed for five minutes every two days, the exposure increasing by three to five minutes each time. All the cases reacted promptly, and after three to four treatments the attacks became less frequent, especially during the night, when the children were suddenly awakened by an irritation in the throat, had to sit up, and finished by vomiting. Dr. Schotten does not think that pertussis can be cured by this treatment, but by reducing the attacks of vomiting the child feels better, the appetite improves, nourishment can be maintained, and weight is not lost. It is recognised that after whooping-cough the glands in the hilum of the lung become swollen, and remain so for a long period, and that tuberculosis often supersedes the disease. Dr. Schotten suggests that by improving the general condition of the patient the swelling of the glands may be prevented from becoming chronic and from forming a medium for other infections.

THE SPAS OF WESTERN ENGLAND AND CENTRAL WALES.

THE Great Western Railway Company have issued an attractive little booklet summarising the therapeutic advantages of the various spas and health resorts served by their lines[2] in the West of England and in Central Wales. In an introduction to the booklet the effect of the recent war upon the British spas is traced, and reference is made to the improved facilities for travel, hotel accommodation, and entertainment, which now enable these resorts to compete on equal terms with those of the Continent. Treatment at a British spa is now within reach of many people for whom visits to continental resorts are out of the question, and the comparative cheapness and ease of travel to the former are here emphasised. The spas dealt with are Bath, Cheltenham, Church Stretton, Droitwich, Leamington Spa, Malvern, Torquay, Weymouth, Builth Wells, Llangammarch Wells, Llandrindod Wells and Llanwrtyd Wells. Two or three pages of historical and geographical description, with notes of the type of cure practised, and in many cases with analyses of the waters, are included in regard to each of the places named; good illustrations and a summary of the specific therapeutic benefits obtainable enhance the value of this little publication.

COMBINED W.C. TRAP AND SOIL-PIPE BRANCH.

Messrs. John Knight and Sons, of 26, Cale-street, Chelsea, S.W. 3, have sent us particulars of a combined W.C. trap, and soil-pipe branch which is carried through the wall of the house. There are no joints to either drain or soil-pipe within the house, and as the trap is fixed clear of the floor the space beneath the pan can be easily kept clean. The pipe branches are made for 9 in., 14 in., and 18 in. walls.

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[2] Annual Returns for 1921. Patna Government Press, 1922.

[1] Deutsche med. Wochenschrift, August 31st, 1923.

[2] Inland and Marine Spas on the Great Western Railway. Published by th[illegible], Paddington Station, London, W. 2.

Dr. Robert Heine Library
7380